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PROPERTY OF
C. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

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The PHOTOFACT Servicer

Vol. #36, Sets 355 & 356 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ May 1, 1957

CORRECTION NOTICE

Motorola Model BKA6T
Photofact Set 345 - Folder 8

The correct IRC replacement for the tone and volume control (Motorola Part No. 18B536819) should be QJ-1027A or the "Concentrikit" equivalent of: Kit K-6, Panel Element B13-137, Panel Shaft P13-118, Rear Element B19-137X, Rear Shaft R1-130 and Switch 76-1.

SERVICE HINTS

The following service hints are through the courtesy of the National Company, Melrose, Mass:

Model "Horizon 5"
Photofact Set 269 - Folder 10

Symptom: To reduce hum & noise

1. Replace 12AX7 tubes with Telefunken 12AX7 or ECC83.

2. Remove four ceramic capacitors on the loudness on-off switch located in the center of the panel. The two capacitors nearest the panel are replaced with 1500 mmf ceramic units. The other two, at the further end of the switch, are replaced with 1000 mmf ceramic units.

3. Add a 47 mmf ceramic capacitor from pin 7 to pin 8 of both 12AX7 tube sockets.

4. Remove the metal shield between the 12AX7 tube sockets and cut off the end which has a partial cut-out and then replace shield in its original position.

5. Remove long blue wire from pin 1 of V2 (12AX7 with shield). Add a shielded lead running it down the chassis to the cut-out opposite the 16 contact plug and connect it to the same terminal as that of the .5 mfd capacitor (C25 - second wafer on selector switch). Ground this shielded lead direct across from this connection on the next wafer on the other side of the switch shield.

6. Add a grounding lug at the outer end of the 16 contact plug positioning it in the opposite direction to the one already there. Place a shim washer under the opposite side of the plug to level it.

7. Remove the brown and black wires from pins 3 and 11 of the plug and replace them with a two-wire shielded lead. Ground the shielded lead to the lug added in step 6. The leads should be brought forward and connected to the front wafer of the selector switch where the brown and black leads were removed.

Service Hints (Cont.)

The following service hints are through the courtesy of RCA Victor Radio & "Victrola" Division of the Radio Corporation of America.

RCA Victor Models 6-BX-5, 7-BX-5
Photofact Set 299 - Folder 7

Symptom: Short "A" Battery Life.

Check "A" Battery drain with set in the "Off" position and the line cord in position for battery operation. If the current drain is in excess of .05 milliamperes (50 microamperes) the filter capacitors C1A & C1B sections may have excess leakage. Normal leakage resistance of the filters will not have any appreciable effect on battery deterioration but excess leakage will cause the battery life to be lowered because of the additional drain in the "off" position.

RCA Victor Model 7-TR-2, 7-TR-3 Recorder
Photofact Set 340 - Folder 16

Symptom: Belt Squeal

If belt squeal is present, it will be noticed with any or none of the pushbuttons depressed. It is caused by belt friction against the sides of the groove in the motor pulley. This squeal can be temporarily releaved by cleaning the drive belt with carbon tetrachloride. Later productions of these recorders use a new motor pulley which has the groove radius increased from .086" to .110" (Pulley Part No. 101473A).

IF Code Interference

In some locations, powerful code transmitters are in operation on frequencies close to the most commonly used i-f frequency of 455 kc. The radiated signal from these transmitters is often strong enough in nearby locations to cause objectionable code interference in radio receivers.

Where such interference is present, the most practical method of elimination is to completely realign the radio receiver using a different i-f frequency. In most cases a lower i-f frequency will reduce the interference but in some locations a higher frequency will be necessary. The amount of frequency shift necessary will depend upon the strength of the interfering signal as well as its relation to 455 kc. It has been found that in severe interference locations, a frequency difference of 20 to 30 kc may be necessary to completely eliminate the interference.

Continued on next page

IF Code Interference (Cont.)

If the range of i-f adjustment is insufficient to enable a transformer winding to be peaked at the desired lower frequency, a ceramic capacitor of 10 mmf to 15 mmf can be added in parallel with that transformer winding in order to change the adjustment range.

When the receiver is aligned with an i-f frequency other than 455 kc there will be a tracking error in which the dial pointer will not indicate correctly the frequency of the broadcast station being received. The tracking error is in direct relation to the amount of frequency shift. This tracking error may sometimes be partially compensated for by shifting the position of the dial pointer to give correct indication at 600 kc before aligning at the high frequency end of the dial.

The following is a listing of the transmitters which are most likely to cause i-f interference:

WSF	442 kc	New York, N. Y.
WSC	460 kc	Tuckerton, N. J.
KPH	460 kc	Bolinas, Calif.
KOK	464 kc	Paramount, Calif.
WSE	464 kc	Jacksonville, Fla.
WOE	472 kc	LaTana, Fla.

In addition, temporary experimental transmitters are in operation with unmodulated carriers as follows:

K12XAJ	450 kc	Pt. Mugu, Calif.
K12XAJ	450 kc	Cambridge, Mass.
K12XAJ	450 kc	Hampton, Va.
K12XAJ	470 kc	Pt. Mugu, Calif.
K12XAJ	470 kc	Cambridge, Mass.
K12XAJ	470 kc	Hampton, Va.

The following service hints are through the courtesy of Sylvania Electric Products, Inc., Batavia, N. Y.

Sylvania Ch. 1-532
Photofact Set 328 - Folder 11 and Set 341 - Folder 15

Symptom: Dial Slippage

Slipping of the dial may be eliminated in the following manner. After calibrating the dial, place a hot soldering iron on the ring gear spring until the wire spring imbeds itself into the plastic. Hold the spring in this position with a screwdriver until the plastic hardens. Repeat this operation at two other points on the ring gear and the slippage will disappear. Later production receivers employ a positive locking dial indicator resulting in non-slipping.

In instances where the dial goes off calibration, check the belt guide at front of tuner. Improper adjustment of this guide will cause the belt to ride upon the edge of the pulley resulting in off-calibration of the dial.

Sylvania Ch. 1-521 Series
Photofact Set 285 - Folder 14

Symptom: Picture "Blooming"

This symptom can be caused by capacitor C56 (picture tube cathode coupling capacitor) having excessive leakage.

The following service hints are through the courtesy of Packard-Bell Electronics, Los Angeles, Calif.

Packard-Bell Ch. 88S2 & 98D2
Photofact Set 349 - Folder 8 and Set 354 - Folder 13.

Symptom: Short Circuits in Deflection Yoke Leads.

Some cases of shorting have occurred where the red yoke lead touches pin #4 of the yoke and also where it passes through the chassis pan. Later production receivers have had sleeving added at these two points and in earlier chassis it may be necessary for the service technician to do likewise. Late production receivers have a thicker insulation instead of sleeving.

Symptom: Sync Buzz (Ch. 98D2)

Occassionally sync buzz has appeared in the audio which may be prevented by changing R56 (1st sound IF grid) from 100KΩ to 33KΩ.

Symptom: Excessive Highs in Audio (Ch. 98D2)

Comment has been made that this chassis produces too many high frequencies, resulting in a sibilance when reproducing voice. This may be reduced, if desired, by changing C50 (6DT6 Plate Bypass) from 470 mmf to 1000 mmf.

Symptom: Audio Drift (Ch. 88S2 & 98D2)

Two changes have been made to minimize drift in the sound detector. The temperature compensation was changed from NPO to N330 on the 22 mmf capacitor across the quadrature coil. Also, the 6DT6 cathode bypass was changed from 1000 mmf to 10000 mmf.

Symptom: Fuse blowing due to arcing (Ch. 88S2 & 98D2)

To prevent arcing at the 6AX4 damper socket, pin #4 instead of pin #6 is used as a tie-point for the black yoke lead and the red/orange-tracer wire to the horizontal output transformer. Terminals #3, 4, & 5 of this socket should be separated as far as possible.

Symptom: Horizontal Instability (Ch. 8S52)

Loss of horizontal sync or "Christmas Tree Effect" has sometimes been caused by parasitic oscillations in this chassis. To correct this situation, make the following wiring changes:

1. The 22 mmf capacitor in the plate circuit of the 6CG7 horizontal oscillator tube should be removed from the terminal strip ground and connected between pin #1 & #9 of this tube socket.

2. On the 6DQ6 socket, the ground lead on pins #2 & #8 should be changed to run from chassis to pin #8, thence to pin #2, keeping the lead length from chassis to pin #8 at a minimum.

3. The .0033 mfd capacitor between the drive control and pin #8 should be removed from pin #8 and grounded to the chassis.

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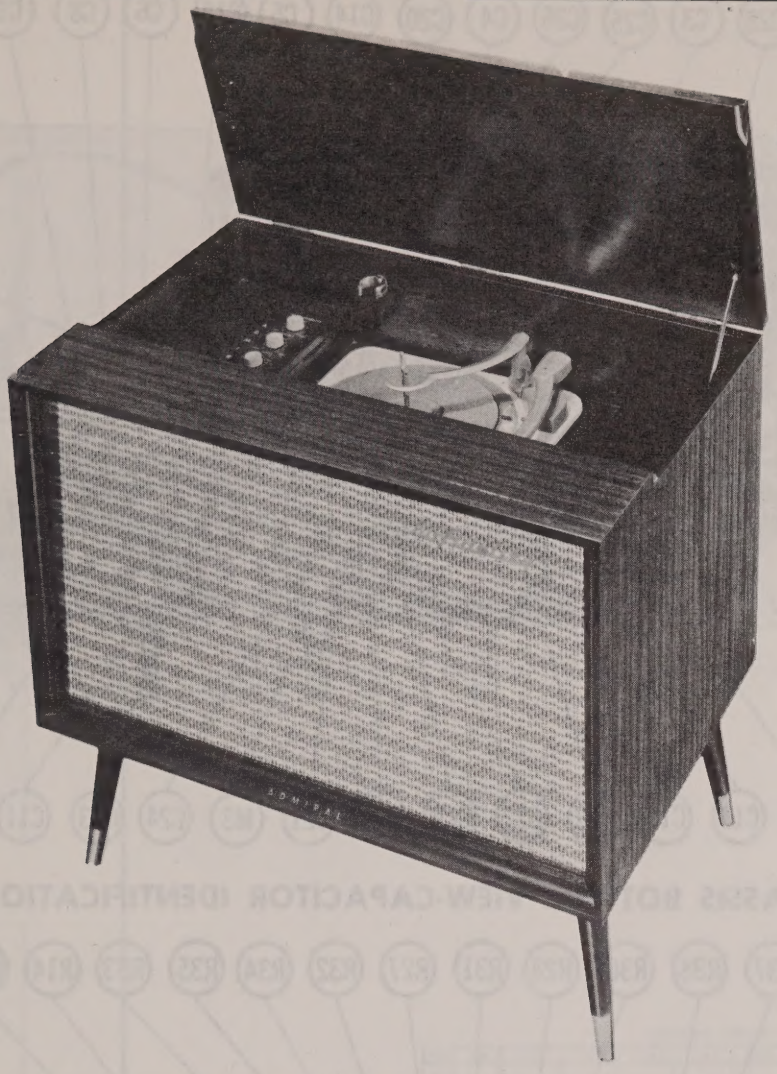
DENVER, COLORADO

ADMIRAL
CHASSIS 6R2, 6R2A



ADMIRAL
CHASSIS 6R2, 6R2A

TRADE NAME	Admiral Models HC4406, HC4407 (Ch. 6R2A), 5M66D, 5M67D (Ch. 6R2)
MANUFACTURER	Admiral Corp., 3800 W. Cortland St., Chicago 47, Illinois
TYPE SET	AC Operated Phono Amplifier With 4 Speed Automatic Record Changer
TUBES (Six)	Types 12AX7 AF Amp.-Cath. Follower, 6AV6 AF Amplifier, 6SN7GTB AF Amp.-Phase Inv., (2) 6V6GT Output, 5Y3GT Rectifier
POWER SUPPLY	110-120 Volts AC - 60 Cycles RATING .65 Amp. @ 117 Volts AC (74 Watts)

MODELS HC4406 AND HC4407 USE RECORD CHANGER RC646 OR RC646-1.
MODELS 5M66D AND 5M67D USE RECORD CHANGER RC654.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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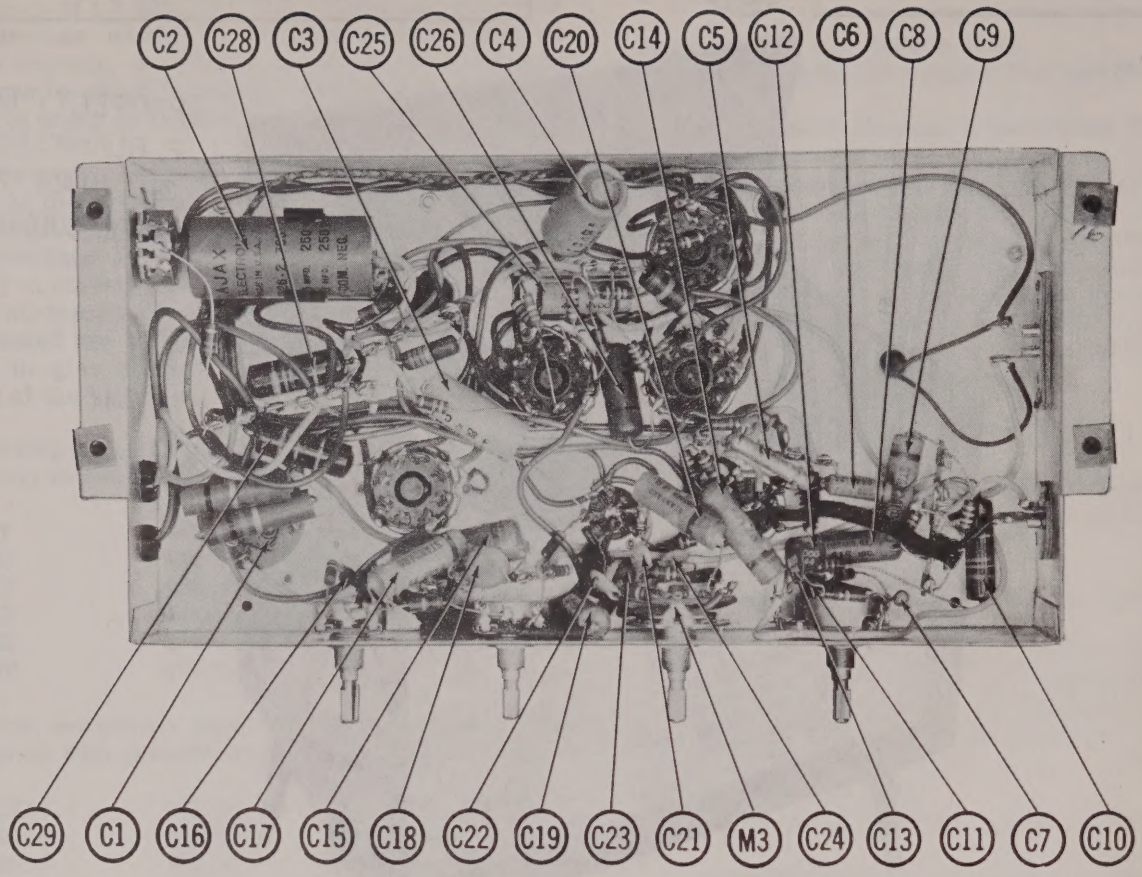
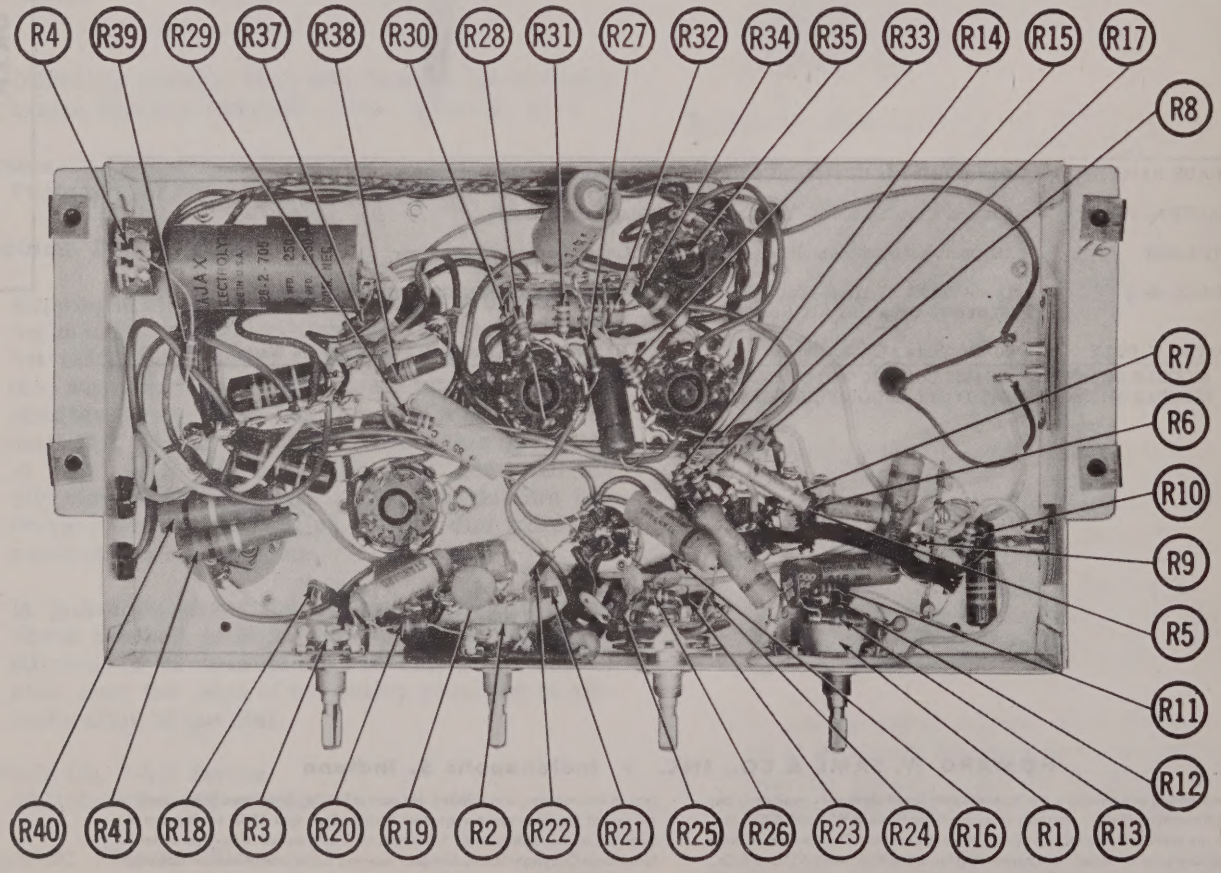


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	1st AF Amp. -Cathode Follower	12AX7	
V2	2nd AF Amp.	6AV6	
V3	3rd AF Amp. -Phase Inv.	6SN7GTB	
V4	Output	6V6GT	
V5	Output	6V6GT	
V6	Rectifier	5Y3GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA ADMIRAL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲80	400	67C7-30	AFH4-18-45	BO480 / BR4045	FP238 / TC80	TMQ-120	Q-065	TVL-4775
B	▲40	400							
C	■40	400							
C2A	40	250	67B26-2	PRS450V4020	CO103	TCT3764	TDLD-21	T-075	TVA-2520
B	10	250							
C3	25	15	67A4-30	PRS25V25	BBR25-25	TC26	TD-25-25	FM-0225	TVA-1205
C4	50	25	6A74-31	PRS25V50	BBR50-25	TC29	TD-50-25	FM-0250	TVA-1206

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA ADMIRAL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C5	850									Note 1
C6	.0022	600	64B1-14	BPD-0022	DD-202	CUB6D22	ED-002	GEM-622	6TM-D2	
C7	250			SI 250	D6-251	L10T25	ED-250	UC-5325	5GA-T25	Note 1
C8	.015	200	64A2-26	BPD-015	DF-153	CUB4S15	ED-015	GEM-6115	6TM-S15	
C9	.015	200	64A2-26	BPD-015	DF-153	CUB4S15	ED-015	GEM-6115	6TM-S15	
C10	.033	400	64B1-23	BPD-03	DF-303	CUB6S33		GEM-6133	4TM-S33	
C11	100		65C6-3	NP0-SI 100	TCZ-100	C10T1C	TCO-100	ZT-531	5TCC-T1	
C12	5000		65C10-1	BPD-005	DD-502	BYA6D5	ED-005	DC521	5HK-D5	
C13	5000		65C10-1	BPD-005	DD-502	BYA6D5	ED-005	DC521	5HK-D5	
C14	.02	400	64B1-24	BPD-02	DD-203	CUB4S2	ED-02	GEM-412	4TM-S2	
C15	.1	200	64B1-30	P288N-1	DF-104	CUB2P1		GEM-401	2TM-P1	
C16	100		65C6-3	NP0-SI 100	TCZ-100	C10T1C	TCO-100	ZT-531	5TCC-T1	
C17	.0068	200	64A2-15	P688N-0068	D6-682	CUB6D68	ED-0068	GEM-6268	6TM-D68	
C18	5000		65C10-1	BPD-005	DD-502	BYA6D5	ED-005	DC521	5HK-D5	
C19	.05	200	64B1-32	BPD-05	DF-502	CUB2S5		GEM-415	2TM-S5	
C20	.02	400	64B1-24	BPD-02	DD-203	CUB4S2	ED-02	GEM-412	4TM-S2	
C21	680		65C10-4	BPD-00068	DD-681	BYA10T68	ED-680	UC-5368	5GA-T68	
C22	680		65C10-4	BPD-00068	DD-681	BYA10T68	ED-680	UC-5368	5GA-T68	
C23	250			SI 250	D6-251	L10T25	ED-250	UC-5325	5GA-T25	Note 1
C24	680		65C10-4	BPD-00068	DD-681	BYA10T68	ED-680	UC-5368	5GA-T68	
C25	.02	400	64B1-24	BPD-02	DD-203	CUB4S2	ED-02	GEM-412	4TM-S2	
C26	.02	400	64B1-24	BPD-02	DD-203	CUB4S2	ED-02	GEM-412	4TM-S2	
C27	4	10	64B13-1	P1.589XP-4						
C28	.047	400	65A13-5	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C29	.047	400	65A13-5	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	

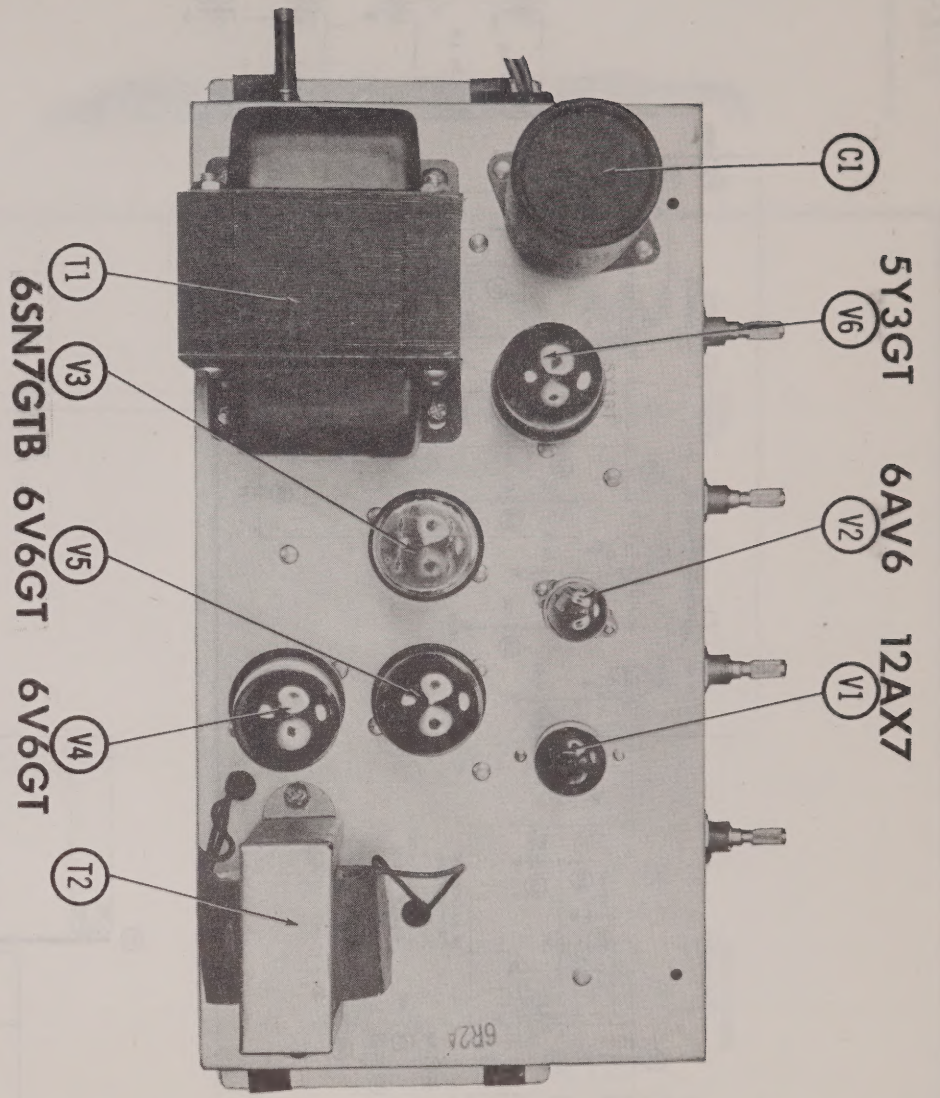
Note 1: Some versions use 220MMF in this application. (Part #65C6-80).

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA ADMIRAL PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	75C1-72				UDT285	Volume, Tap @ 150K & 350K
B	Shaft							
R2A	1Meg	½	75C1-68	B-69	A47-1Meg-S	Q11-137	U54	Bass
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R3A	1Meg	½	75C1-68	B-69	A47-1Meg-S	Q11-137	U54	Treble
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R4A	6000Ω	½	75D13-81	B-13				Hum Level - Note 1
B	Shaft			Not Req.				

Note 1: Alternate part #75C13-66 may be used in some versions.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ADMIRAL PART No.	IRC PART No.	
R5	1Meg		60B8-105	BTS-1Meg	
R6	100K		60B7-104	BTS-100K	
R7	2200Ω		60B8-222	BTS-2200	
R8	10K 5%		60B7-103	BTS-10K 5%	
R9	220K		60B8-224	BTS-220K	
R10	390K		60B8-394	BTS-390K	
R11	390K		60B8-394	BTS-390K	
R12	51K 5%		60B7-513	BTS-51K 5%	
R13	51K 5%		60B7-513	BTS-51K 5%	
R14	470K		60B8-474	BTS-470K	
R15	22K		60B8-223	BTS-22K	
R16	220K		60B8-224	BTS-220K	
R17	470Ω		60B8-471	BTS-470	
R18	150K		60B8-154	BTS-150K	
R19	47K 5%		60B7-473	BTS-47K 5%	
R20	10K		60B8-103	BTS-10K	
R21	4700Ω 5%		60B7-472	BTS-4700 5%	
R22	1000Ω		60B8-102	BTS-1000	
R23	180K		60B8-184	BTS-180K	
R24	82K		60B8-823	BTS-82K	
R25	120K		60B8-124	BTS-120K	
R26	120K		60B8-124	BTS-120K	
R27	1Meg		60B8-105	BTS-1Meg	
R28	330K		60B8-334	BTS-330K	
R29	4700Ω		60B8-472	BTS-4700	
R30	47K		60B8-473	BTS-47K	
R31	47K		60B8-473	BTS-47K	
R32	470K		60B8-474	BTS-470K	
R33	470K		60B8-474	BTS-470K	
R34	270Ω	2	60B20-271	BTB-270	
R35	3900Ω		60B8-392	BTS-3900	
R36	22Ω	1	60B14-220	BTA-22	
R37	10K		60B8-103	BTS-10K	
R38	22K	1	60B14-223	BTA-22K	
R39	1.8Meg		60B8-185	BTS-1.8Meg	
R40	100Ω	2	60B20-101	BTB-100	
R41	100Ω	2	60B20-101	BTB-100	

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @ .65A	630VCT @ .082A	5VAC @ 2A	6.3VCT @ 2.2A	80B48-3	P9310		PC8409	22R04 ①	R-11A

① Use Universal mounting brackets.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	4800Ω CT	2Ω	79C56-4	Z1011	A-2904 ①	A-3850 ①	22S62	S-55X	① Drill new mtg. hole.

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ADMIRAL PART No.	QUAM PART No.	
SP1	3½"	PM	3-4Ω	78B91-2 ① ②	3A15TZ3 ②	① Used in all models.
SP2	4"	PM	6-8Ω	78B84-6 ② ③	4A1Z8 ②	② Connect in proper phase.
SP3	5 1/4"	PM	6-8Ω	78B110-4 ② ③	52A1Z8 ②	③ Used in models HC4406, HC4407.
SP4	12"	PM	3-4Ω	78B112-1 ① ②	12A31 ②	④ Used in models 5M66D, 5M67D.
	5"	PM		78B110-1 ④		

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	ADMIRAL PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	MOUNT	
M1	409B20	55-T	GD-J	56	PT-2	

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

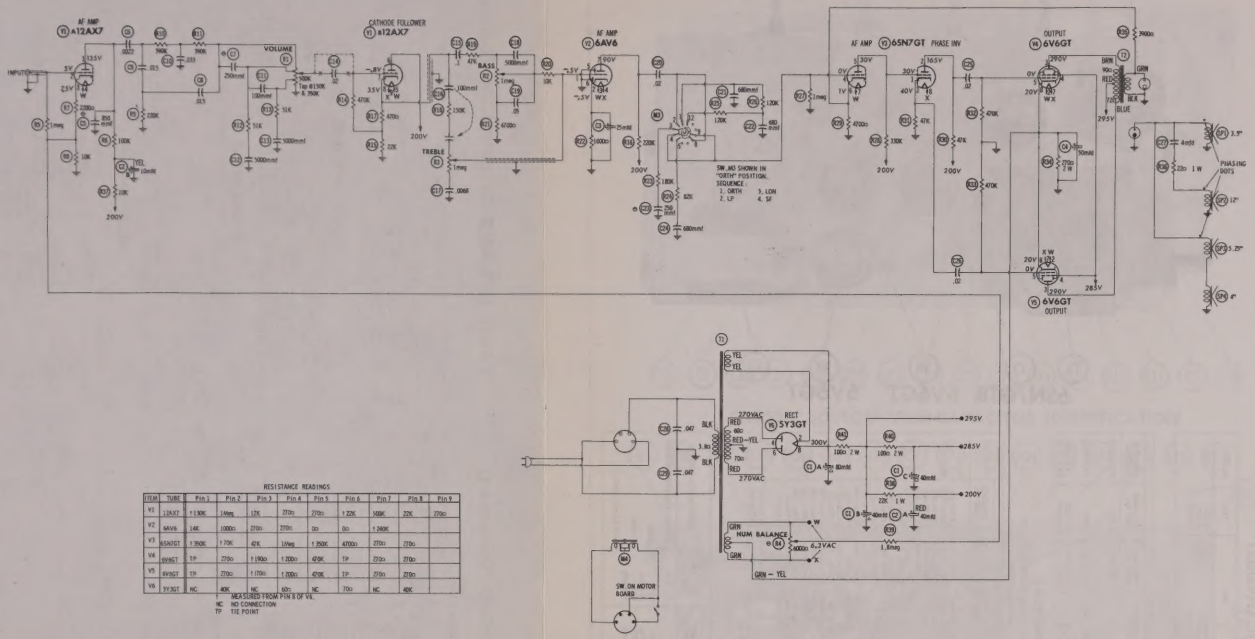
PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	ADMIRAL PART No.	JENSEN PART No.	WALCO PART No.	
M2	98B15-43 or 98B15-45	*JP-36 or †JPS-36 or †♦JPS-36SD or ♦JPS-36D	*W-33TPA or †W-33TPS or †♦W-33DS or ♦W-33TPD	* Metal † Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M3	Switch	77A56	Compensation (Rotary, Wafer Type)
M4	Phono Motor	407C23	Model RC646 Changer.
	Phono Motor	407C24	Model RC646-1 Changer.
	Phono Motor	G400B663-2	Model RC654 Changer.
	Knobs	33A169-2	Models HC4406, HC4407.
	Knobs	33A169-1	Models 5M66D, 5M67D.
	Cabinet	35E385-2	Mahogany
	Cabinet	35E385-3	Blonde
	Cabinet	35E355-2	Mahogany, Model 5M66D.
	Cabinet	35E355-3	Blonde, Model 5M67D.



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	1130K	1Meg	12K	270Ω	270Ω	1.22K	500K	22K	270Ω
V2	6AV6	14K	1000Ω	270Ω	270Ω	0Ω	0Ω	1.240K		
V3	6SN7GT	1.350K	1.70K	47K	1Meg	1.350K	47000Ω	270Ω	270Ω	
V4	6V6GT	TP	270Ω	1.190Ω	1.200Ω	470K	TP	270Ω	270Ω	
V5	6V6GT	TP	270Ω	1.170Ω	1.200Ω	470K	TP	270Ω	270Ω	
V6	5Y3GT	NC	40K	NC	60Ω	NC	70Ω	NC	40K	

MEASURED FROM PIN 8 OF V1.
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

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AIRLINE MODELS
GTC-1085A, GTC-1086A

AIRLINE MODELS
GTC-1085A, GTC-1086A

TRADE NAME	Airline Models GTC-1085A, GTC-1086A
SUPPLIER	Montgomery Ward & Co., 619 Chicago Ave., Chicago, Ill.
TYPE SET	Three Power Portable AM Receiver
TUBES (Four)	Types 1R5 Converter, 1U4 IF Amplifier, 1U5 Det.-AVC-AF Amp., 3V4 Output
POWER SUPPLY	105-125 Volts AC-DC (or) 3 Volts "A" Supply & 90 Volts "B" Supply
RATING	.15 Amp. @ 117 Volts AC (or) 150MA @ 3 Volts DC & 7.5MA @ 90 Volts DC
TUNING RANGE—BROADCAST	535KC - 1630KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use battery power, if possible. If AC power is used, use an isolation transformer when available. If not, connect a .1MFD capacitor in series with low side of the signal generator and B-.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to antenna lug on tuning gang. Low side to B-.	455KC (400∿Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200MMF to reduce hum modulation.
2.	"	"	1630KC	"	"	A4	"
3.	"	"	535KC	Tuning gang fully closed	"	A5	"
4.		Loop	1400KC	Tune to 1400KC signal	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

AIRLINE
Model GTC-1085A

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	1R5	
V2	IF Amplifier	1U4	
V3	Det.-AVC-AF Amp.	1U5	
V4	Output	3V4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA AIRLINE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲40	150	EC-32	AFH3-09	CO080	FP210	TMT-8	T-040	R2312 *
B	■40	150				TC48			
C	20	150							
C2	70	15	EC-6	PRS15V100	BBR100-15		TD-100-15		TVA-1160

* Non-catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA AIRLINE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C3	220		CC-33	SI220	D6-221	TP39	GP2K-221	UC-5322	5GA-T22	
C4	10000		CC-4	BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C5	100		CC-5	NP0-SI100	D6-101	TZ30	801-101	ZT-531	5TCC-T1	
C6	10000		CC-4	BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C7	10000		CC-4	BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C8	1500		CC-20	SI1500	D6-152	TP54	GP2L-152	UC-5215	5GA-D15	
C9	.1	200	PC-3	P288N-1	DF-104	CUB2P1		PT401	2TM-P1	
C10	.047	400	PC-5	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C11	.1	400	PC-8	P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C12	220		CC-33	SI220	D6-221	TP39	GP2K-221	UC-5322	5GA-T22	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA AIRLINE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	1.5Meg	½	VC-47					Volume & switch

RESISTORS

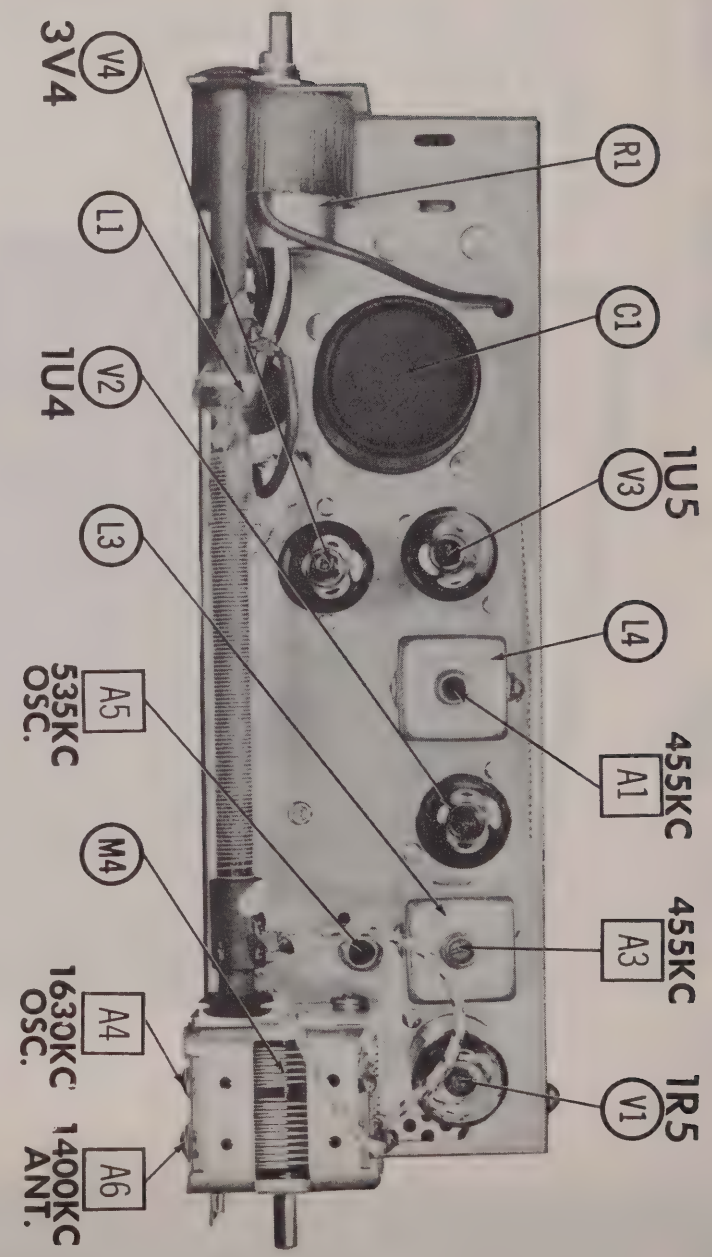
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA AIRLINE PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R2	1Meg			BTS-1Meg	
R3	15K		IR-63	BTS-15K	
R4	100K		IR-43	BTS-100K	
R5	3.3Meg		IR-23	BTS-3.3Meg	
R6	10Meg		IR-3	BTS-10Meg	
R7	470Ω		IR-1	BTS-470	
R8	2.2Meg		IR-13	BTS-2.2Meg	
R9	33Ω		IR-17	BTS-33	
R10	270Ω		IR-33	BTS-270	
R11	620Ω 5%		IR-39	BTS-620 5%	
R12	220K		IR-20	BTS-220K	
R13	620Ω 5%		IR-39	BTS-620 5%	
R14	2200Ω	1	IR-25	BTA-2200	
R15A	1050Ω	10	WR-7	1 3/4A-2000	
B	1050Ω	10			
R16	47Ω	1	IR-41	BTA-47	
R17	33Ω		IR-17	BTS-33	
R18	220K		IR-20	BTS-220K	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA AIRLINE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	1050Ω	3-4Ω	Part of Spkr.	Z1117 ①	A-2998	A-3329	24S49	S-11X	① Drill one new mounting hole.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	AIRLINE PART No.	QUAM PART No.		
SP1	4"	PM	3-4Ω	SPK-29 ①	4A07		① Includes T1

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	AIRLINE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Stick	1.9Ω		LL-30				
L2	Osc. Coil	1Ω	8.5Ω	LO-18			71-OSC	
L3	Input IF	30Ω	30Ω	LI-10	16-6780	BC-356	13-PC1	
L4	Output IF	40Ω	40Ω	LI-11		BC-357		

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	AIRLINE PART No.	REPLACEMENT DATA	
K1	Audio Circuit	2000MMF, 150MMF, 10000MMF, 150MMF, 5000MMF, 10Meg, 4.7Meg, 3.3Meg, 1Meg	MC-18	Aerovox Centralab Sprague	PA-521 PC-165 DP-1

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	AIRLINE PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.075A	SR-2	1003A	RS075	6S75	5M4	75	

BATTERIES

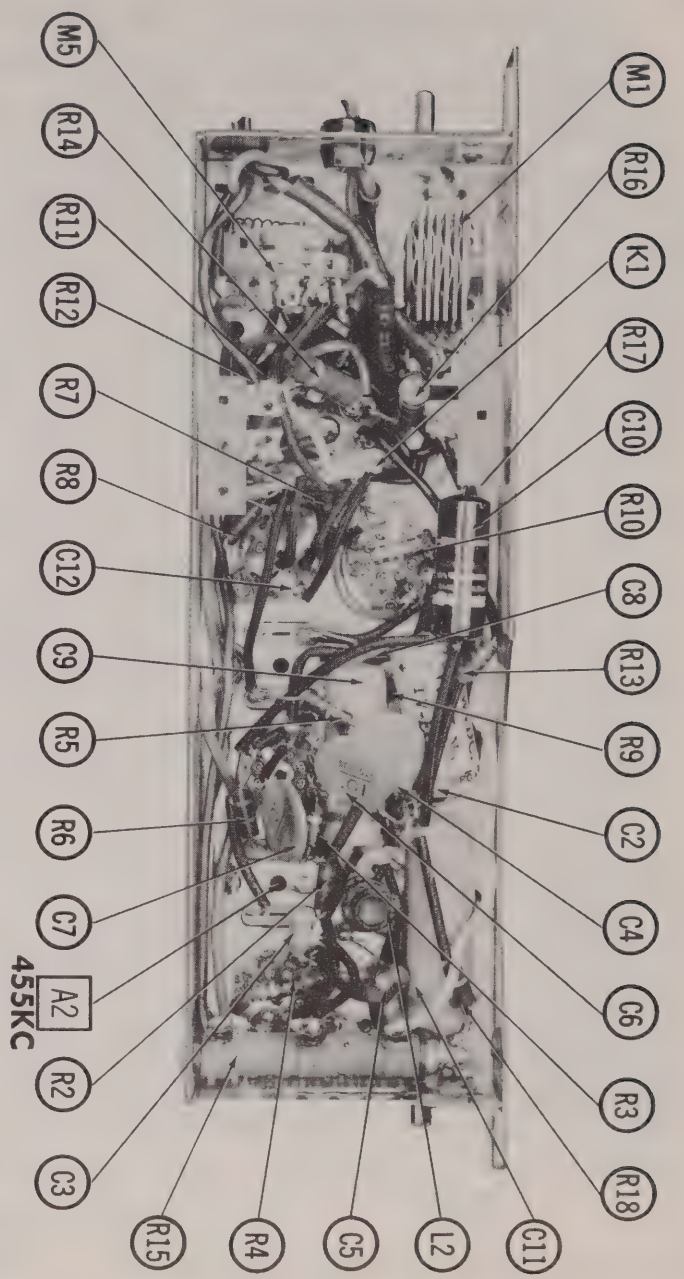
ITEM No.	VOLTAGE	AIRLINE PART No.	REPLACEMENT DATA								
			BURGESS			EVEREADY			MALLORY		
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	"A"	"B"	"A-B"
M2	1.5V "A"		21R *			964 *			M-20 *		
M3	45V "B"			XX30 *			455 *			M-201 *	

* CONNECT 2 IN SERIES

MISCELLANEOUS

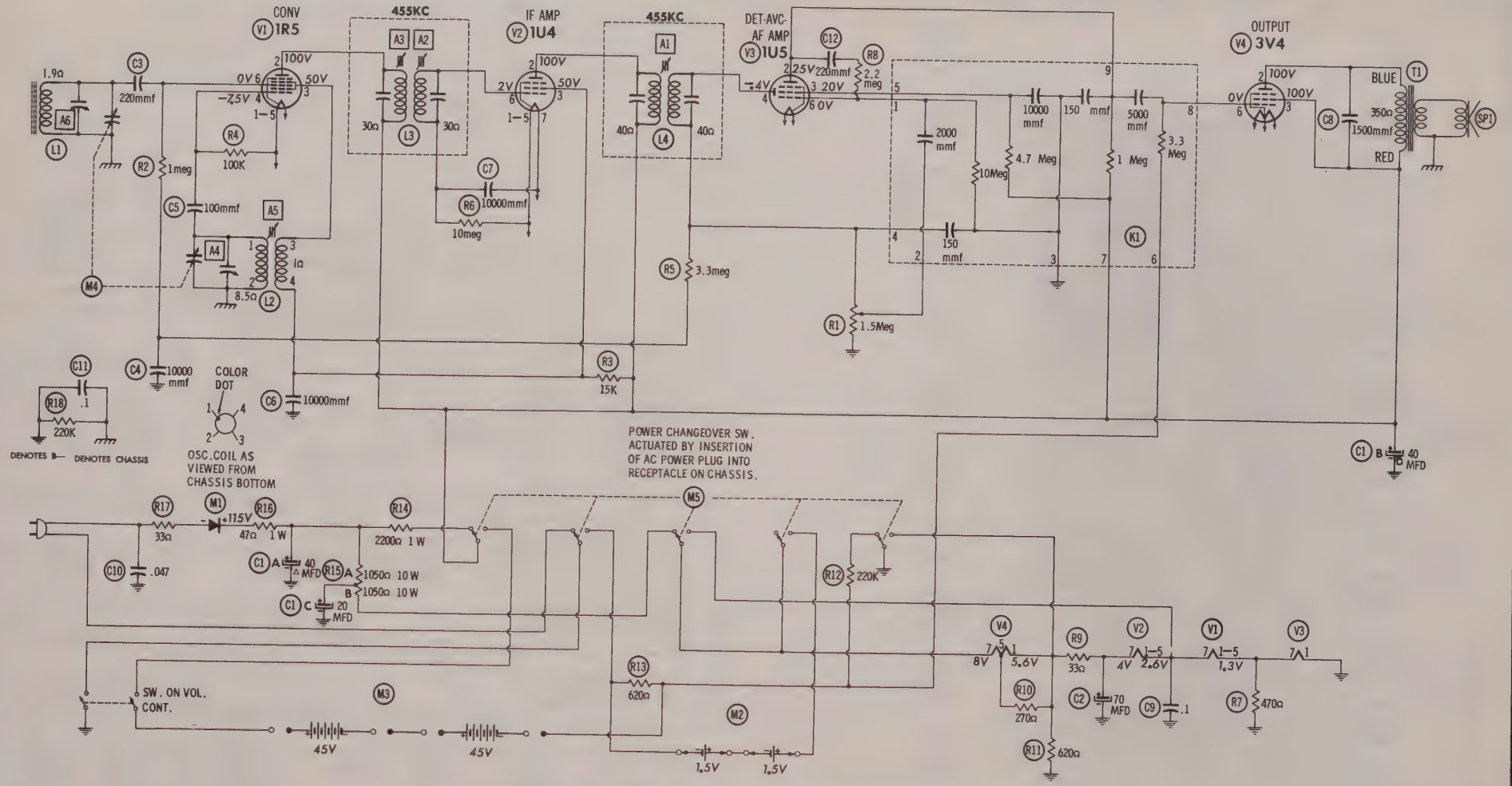
ITEM No.	PART NAME	AIRLINE PART No.	NOTES
M4	Tuning Cap.	GC-12	2 Gang (13-240MMF, 13-110MMF)
M5	Switch	SW-18	Power Changeover (6 pole - 2 position, rotary, wafer type)
	Cabinet	1085	(Maroon) Model GTC-1085A
	Cabinet	1086	(Green) Model GTC-1086A

CHASSIS—BOTTOM VIEW



AIRLINE
Model GTC-1085A

AIRLINE
Model GTC-1085A



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	1R5	•	†2200Ω	†17K	100K	•	5.8Meg	•
V2	1U4	•	†2200Ω	†17K	TP	•	10Meg	•
V3	1U5	•	†1Meg	†4.7Meg	1.5 Meg	TP	10Meg	•
V4	3V4	•	†2600Ω	†2200Ω	NC	•	3.5 Meg	•

• DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.
† MEASURED FROM OUTPUT OF M1.
TP TIE POINT
NC NO CONNECTION.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum. no signal applied for voltage measurements.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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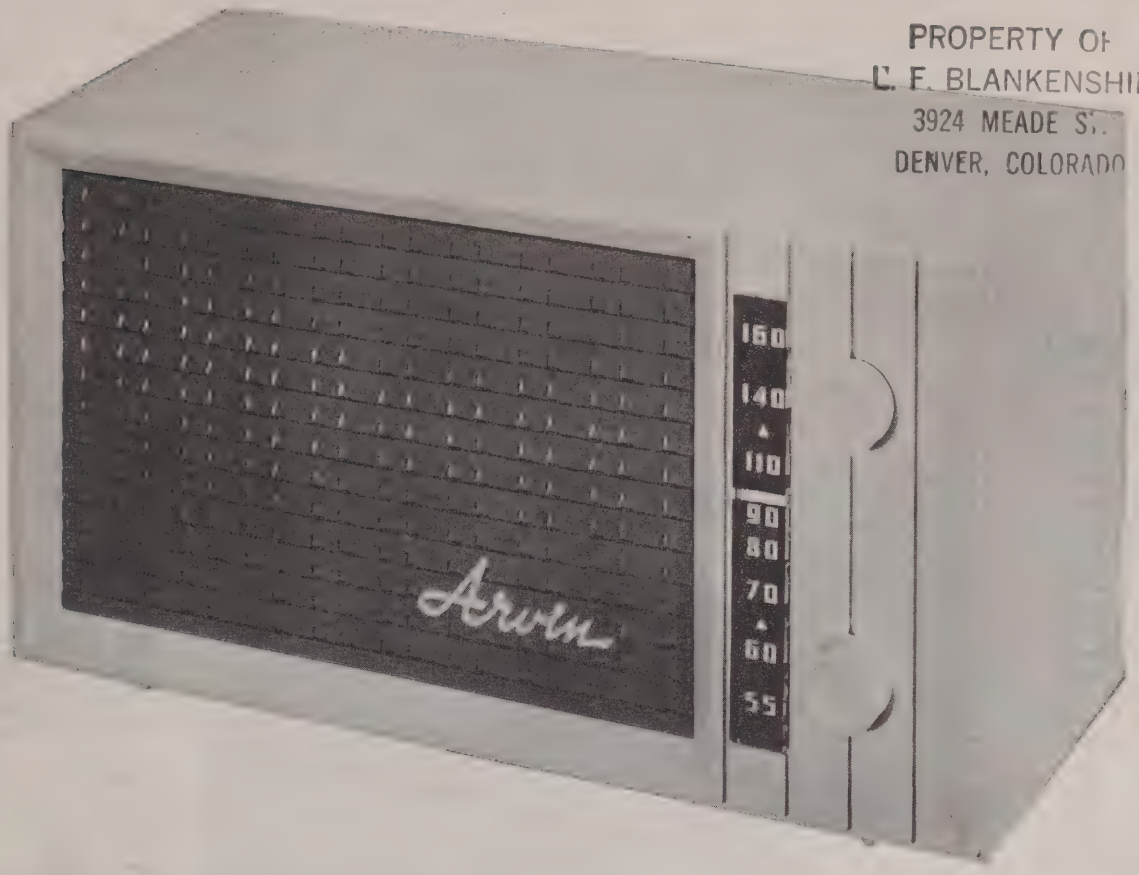
ARVIN MODELS 2563
(Ch. 1.40300), 2564 (Ch. 1.40400)



ARVIN MODELS 2563
(Ch. 1.40300), 2564 (Ch. 1.40400)

TRADE NAME Arvin Models 2563 (Ch. 1.40300), 2564 (Ch. 1.40400)
MANUFACTURER Arvin Industries, Inc., Columbus, Ind.
TYPE SET AC-DC Operated AM Receiver
TUBES (Five) Types 12BE6 Converter, 12BA6 IF Amplifier, 12AV6 Det-AVC-AF Amp., 50C5 Output, 35W4 Rectifier

POWER SUPPLY 110-120 Volts AC-DC RATING .25 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST 535KC-1670KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
To set pointer, turn tuning capacitor fully closed and set pointer parallel with base of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC (400~ Mod)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1670KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal.	"	A6	"
4.		"	600KC	Tune to 600KC signal.	"	A7	Adjust for maximum output while rocking tuning gang.

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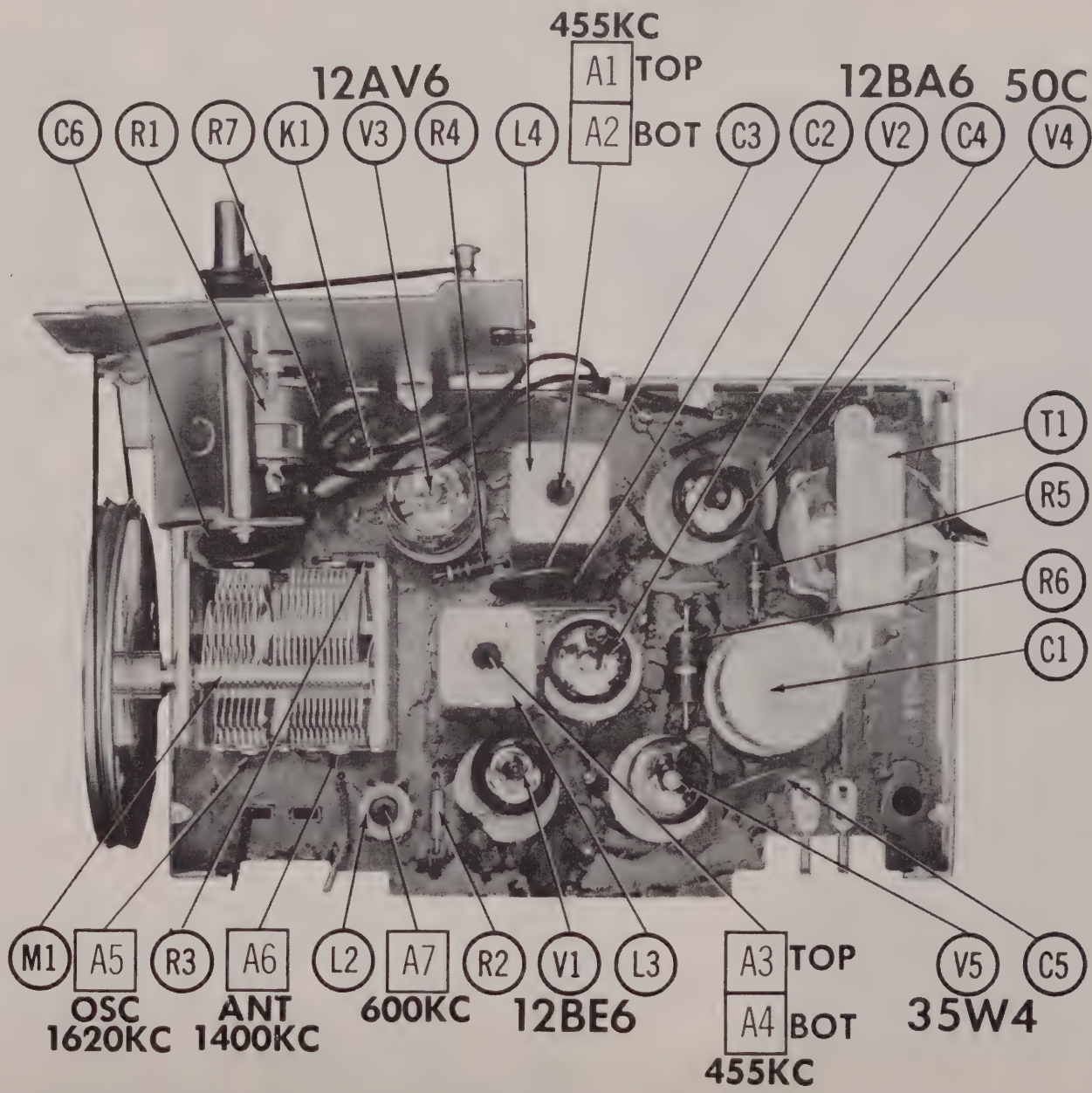


CHASSIS TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	IF Amplifier	12BA6	
V3	Det-AVC-AF Amp.	12AV6	
V4	Output	50C5	
V5	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	ARVIN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■50	150	43672	AFH2-15	BO150	FP213	TMD-12	D065	TVL-2432
B	▲30	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	ARVIN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	20000		43674-2	BPD-02	DD-203	K085	ED-02		5HK-S2	
C3	150		43957-2	BPD-00015	DD-151	G046	ED-150	UC-5315	5GA-T15	
C4	10000		43674-1	BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	
C5	20000		43674-2	BPD-02	DD-203	K085	ED-02		5HK-S2	
C6	20000		43674-2	BPD-02	DD-203	K085	ED-02		5HK-S2	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ARVIN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	500K	½	43745					Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ARVIN PART No.	IRC PART No.	
R2	22K			BTS-22K	
R3	2.2Meg			BTS-2.2Meg	
R4	47K			BTS-47K	
R5	120Ω			BTS-120	
R6	1200Ω	1		BTA-1200	
R7	330K			BTS-330K	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	ARVIN PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2900Ω	3-4Ω	42700-13	Z1004 ①	A-3025	A-3332	26S58 ①	S-12X	① Fabricate mtg.

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	ARVIN PART No.	QUAM PART No.		
SP1	4"	PM	3-4Ω	22875	5A07		

COILS (RF-IF)

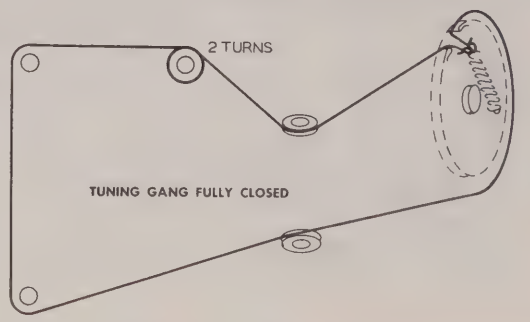
ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	ARVIN PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	3.3Ω		43768-2				Includes Cabinet Back
L2	Osc. Coil	.4Ω	5Ω	43644-1				
L3	Input IF	16Ω	16Ω	43669-1				
L4	Output IF	16Ω	16Ω	43669-1				

COMPONENT COMBINATIONS

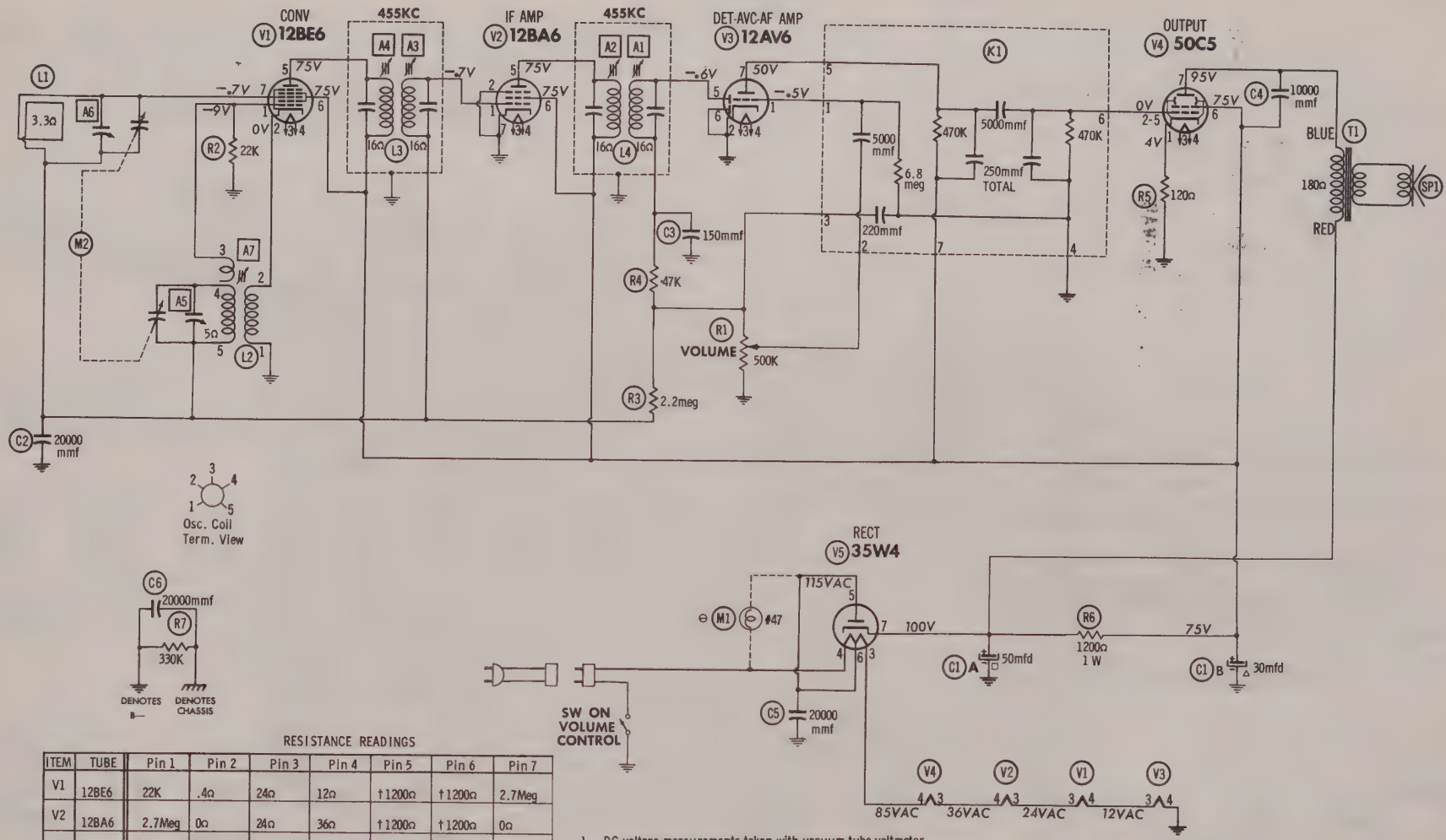
ITEM No.	USE	DESCRIPTION	ARVIN PART No.	REPLACEMENT DATA	
K1	Audio Circuit	6.8Meg, 470K, 470K, 220MMF, 250MMF, 5000MMF, 5000MMF	43743-1	Aerovox Centralab Sprague	PA-512 PC-158 DT-5

MISCELLANEOUS

ITEM No.	PART NAME	ARVIN PART No.	NOTES
M1	Dial Light	23849	#47 (Model 2564 Only)
M2	Tuning Cap	43987	2 Gang
	Knob	43736-16	Apple Green
	Knob	43736-28	Cocoa Brown
	Knob	43734-17	Ivory
	Knob	43734-19	Charcoal
	Cabinet	44221-16	Apple Green
	Cabinet	44221-28	Cocoa Brown
	Cabinet	44221-17	Ivory
	Cabinet	44221-19	Charcoal
	Dial Crystal	43685	
	Pointer	43748	
	Printed Circuit	43743-1	



DIAL CORD STRINGING



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	.4Ω	24Ω	12Ω	†1200Ω	†1200Ω	2.7Meg
V2	12BA6	2.7Meg	0Ω	24Ω	36Ω	†1200Ω	†1200Ω	0Ω
V3	12AV6	6.8Meg	0Ω	12Ω	0Ω	550K	0Ω	†470K
V4	50C5	120Ω	470K	36Ω	85Ω	470K	†1200Ω	†180Ω
V5	35W4	NC	NC	85Ω	115Ω	105Ω	105Ω	50K

† MEASURED FROM PIN 7 OF V5.
NC NO CONNECTION.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to commom negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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COLUMBIA RECORDS
MODEL 526

COLUMBIA RECORDS
MODEL 526

TRADE NAME	Columbia Records Model 526
MANUFACTURER	Columbia Records, 799 Seventh Ave., New York 19, N.Y.
TYPE SET	AC Operated Phono Amplifier With 4 Speed Automatic Record Changer
TUBES (Three)	Types 12AX7 AF Amp.-Phase Inv., (2) 50L6GT Output
POWER SUPPLY	105-125 Volts AC - 60 Cycles RATING .39 Amp. @ 117 Volts AC (35 Watts)

FOR SERVICE INFORMATION ON RECORD CHANGER - SEE SIMILAR V-M MODEL 1200A - PHOTOFACT SET 353 FOLDER 16

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PARTS LIST AND DESCRIPTIONS

COLUMBIA RECORDS
MODEL 526

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amp. -Phase Inv.	12AX7	
V2	Output	50L6GT	
V3	Output	50L6GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Columbia Records PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	20	250	11B708	PRS250V20	BR2025	TC55	TD-20-250	FM-2520	TVA-1508
C2A	20	250	11B707	AFH3-42	CO330	FP376. 9		T-160	TVA-4748
B	40	300							
C	30	300							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	Columbia Records PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3	. 05	400		BPD-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C4	680			BPD-00068	DD-681	BYA10T68	ED-680	UC-5368	5GA-T68	
C5	270			BPD-00027	DD-271	L10T27	ED-270	UC-5327	5GA-T27	
C6	2000			BPD-002	DD-202	BYA10D2	ED-002	DC522	5HK-D2	
C7	2000			BPD-002	DD-202	BYA10D2	ED-002	DC522	5HK-D2	
C8	100			SI 100	D6-101	L10T1	ED-100	UC-531	5GA-T1	
C9	. 22	200		P488N-22		CUB4P22		GEM-4022	4TM-P22	
C10	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C11	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C12	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C13	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C14	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C15	. 1	400		P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C16	. 05	400		BPD-05	DF-503	CUB4S5		GEM-415	4TM-S5	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Columbia Records PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	3Meg	½	9B556					Volume, Tap ② 1Meg, 1. 5Meg
R2A	250K	½	9B553	ABT-53	A47F1-250K	Q13-130X		Treble, Tap ② 100K
B	Shaft			AK-4	KSS-3	Not Req.		
R3A	5Meg	½	9B552	AB-88	A47-5Meg-Z	Q13-141	U65	Bass
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	

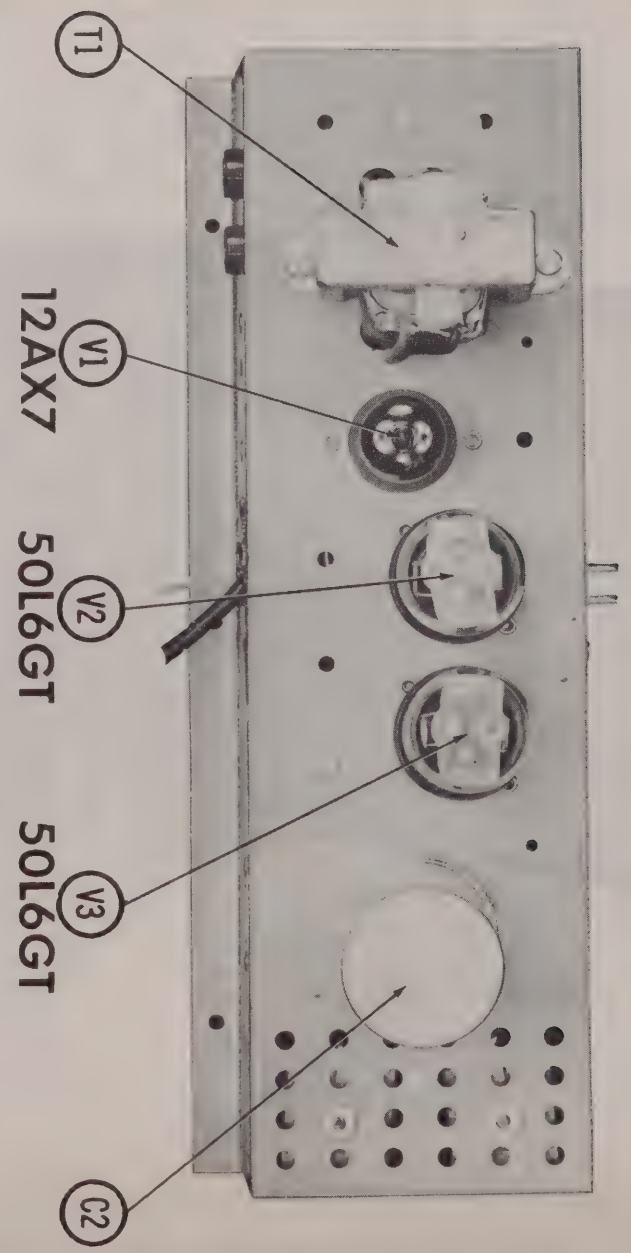
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Columbia Records PART No.	IRC PART No.	
R4	33K 5%			BTS-33K 5%	
R5	220K 5%			BTS-220K 5%	
R6	100K			BTS-100K	
R7	100K			BTS-100K	
R8	220K 5%			BTS-220K 5%	
R9	270Ω			BTS-270	
R10	47K			BTS-47K	
R11	33K 5%			BTS-33K 5%	
R12	270K 5%			BTS-270K 5%	
R13	270K 5%			BTS-270K 5%	
R14	270K 5%			BTS-270K 5%	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Columbia Records PART No.	IRC PART No.	
R15	10Meg			BTS-10Meg	
R16	220K 5%			BTS-220K 5%	
R17	150Ω	2		BTB-150	
R18	10K	2		BTB-10K	
R19	10K	2		BTB-10K	
R20	6. 8Meg			BTS-6. 8Meg	
R21	6. 8Meg			BTS-6. 8Meg	
R22	10K	1		BTA-10K	
R23	220Ω	5			
R24	22Ω	1		BTA-22	
R25	47Ω	5		PW7-50	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC. 1	Columbia Records PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	7300Ω CT	1.6Ω	3B206						
	Turns	Ratio							
	PRI.	SEC. 2							
	13 :	1							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Columbia Records PART No.	QUAM PART No.	
SP1	6"	PM	3-4Ω	1B108	6A21	① Electrostatic type.
SP2	6"	PM	3-4Ω	1B108	6A21	
SP3			①	1A106		
SP4			①	1A106		

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	Columbia Records PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.070A	10B604	1005A	RS150	6S150	5P1	150	
M2	.070A	10B604	1005A	RS150	6S150	5P1	150	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	Columbia Records PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	MOUNT	
M3	CPU-201	55-T	GD	56	PT-2	

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

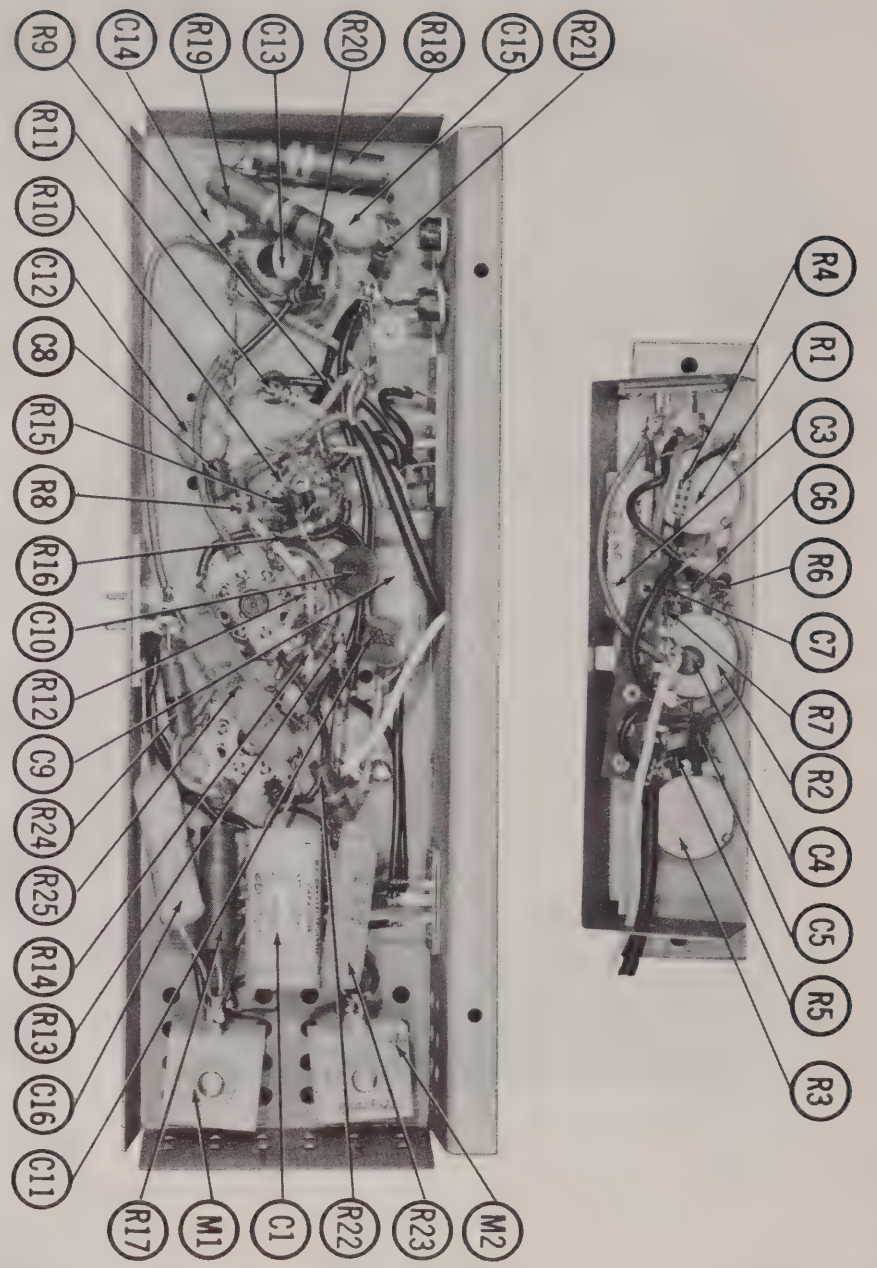
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	Columbia Records PART No.	JENSEN PART No.	WALCO PART No.	
M4		†S-61 or †♦S-61SD or ♦S-61D	†W-77TPS or †♦W-77DS or ♦W-77TPD	† Jewel ♦ Diamond

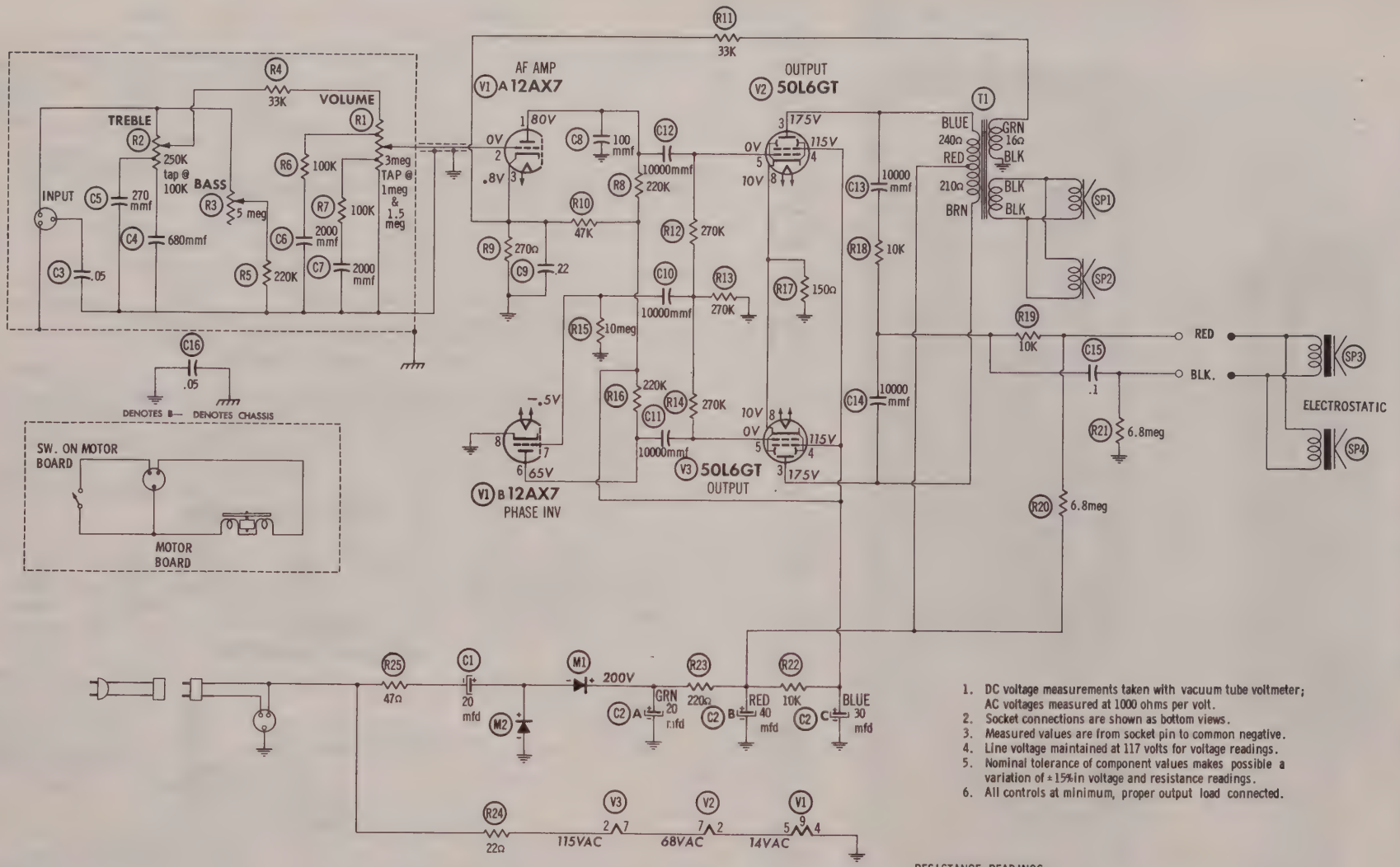
MISCELLANEOUS

ITEM No.	PART NAME	Columbia Records PART No.	NOTES
	Knobs	8B421	Nickel
	Knobs	8B422	Brass
	Cabinet	17B942	Tan
	Cabinet	17B943	Charcoal
	Cabinet	17B944	Copper

CHASSIS—BOTTOM VIEW



COLUMBIA RECORDS MODEL 526



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†230K	0Ω	270Ω	0Ω	14Ω	†230K	10Meg	0Ω	7Ω
V2	50L6GT	NC	14Ω	†460Ω	†10K	540K	TP	65Ω	150Ω	
V3	50L6GT	NC	120Ω	†430Ω	†10K	540K	TP	65Ω	150Ω	

† MEASURED FROM OUTPUT OF M1.
NC NO CONNECTION
TP TIE POINT

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CORONADO
MODEL RA48-8352A

CORONADO
MODEL RA48-8352A

TRADE NAME	Coronado Model RA48-8352A
SUPPLIER	Gamble-Skogmo Inc., 15 N. 8th St., Minneapolis, Minn.
TYPE SET	AC-DC Operated AM Receiver
TUBES (Six)	Types 6BJ6 RF Amplifier, 12BE6 Converter, 6BJ6 IF Amplifier, 12AV6 Det-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-DC — RATING .31 Amp. @ 117 Volts AC (28 Watts)
TUNING RANGE—BROADCAST	540-1650KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when the receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V2). Low side to B-.	456KC (400~ Mod)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	"	1650KC	"	"	A5	"
3.		Loop	1500KC	Tune to 1500KC signal.	"	A6	"
4.		"	600KC	Tune to 600KC signal.	"	A7	"

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PARTS LIST AND DESCRIPTIONS

CORONADO
MODEL RA48-8352A

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	6BJ6	
V2	Converter	12BE6	
V3	IF Amplifier	6BJ6	

ITEM No.	USE	TYPE	NOTES
V4	Det-AVC-AF Amp.	12AV6	
V5	Output	50C5	
V6	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	CORONADO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	70	150	150-125	PRS150V8040	BBRT84215	TCT3117	TDLT-7	T-055	TVA-3455
B	20	150		20					
C	50	150							
C2	4	15	150-127 (Note 1)						

Note 1: Non-polarized unit.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	CORONADO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3	100	500		1468-0001	D6-101	5W5T1	GP-100	MC235	1FM-31	
C4	.068	200		P488N-068		CUB6S68		GEM-4168	4TM-S68	
C5	.068	200		P488N-068		CUB6S68		GEM-4168	4TM-S68	
C6	.05	400	152-105	BPD-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C7	.01	600		BPD-01	DD-103	CUB6S1	GP-10000	GEM-615	6TM-S1	
C8	100			1468-0001	D6-101	5W5T1	GP-100	MC235	1FM-31	
C9	10000			BPD-01	DD-103	BYA6S1	GP-10000	DC511	5HK-S1	
C10	.0047	600		BPD-0047	D6-472	CUB6D47	GP-4700	GEM-6247	6TM-D47	
C11	.001	600		BPD-001	DD-102	CUB6D1	GP-1000	GEM-621	6TM-D1	
C12	10000			BPD-01	DD-103	BYA6S1	GP-10000	DC511	5HK-S1	
C13	.05	400	152-105	BPD-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C14	.2	600		P688N-2		CUB6P2		GEM-602	6TM-P2	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	CORONADO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	1/2	120-128	F1-41		♦	UF55A	Tone
B	500K			R1-41			UR55A	Volume
C	Switch			KB-1			US-26	

♦ Concentrikit Equivalent, Kit K-2, Base Elements & Shafts: B13-133, P1-114 (Panel)
B13-133, R1-130 (Rear)
76-1 Switch

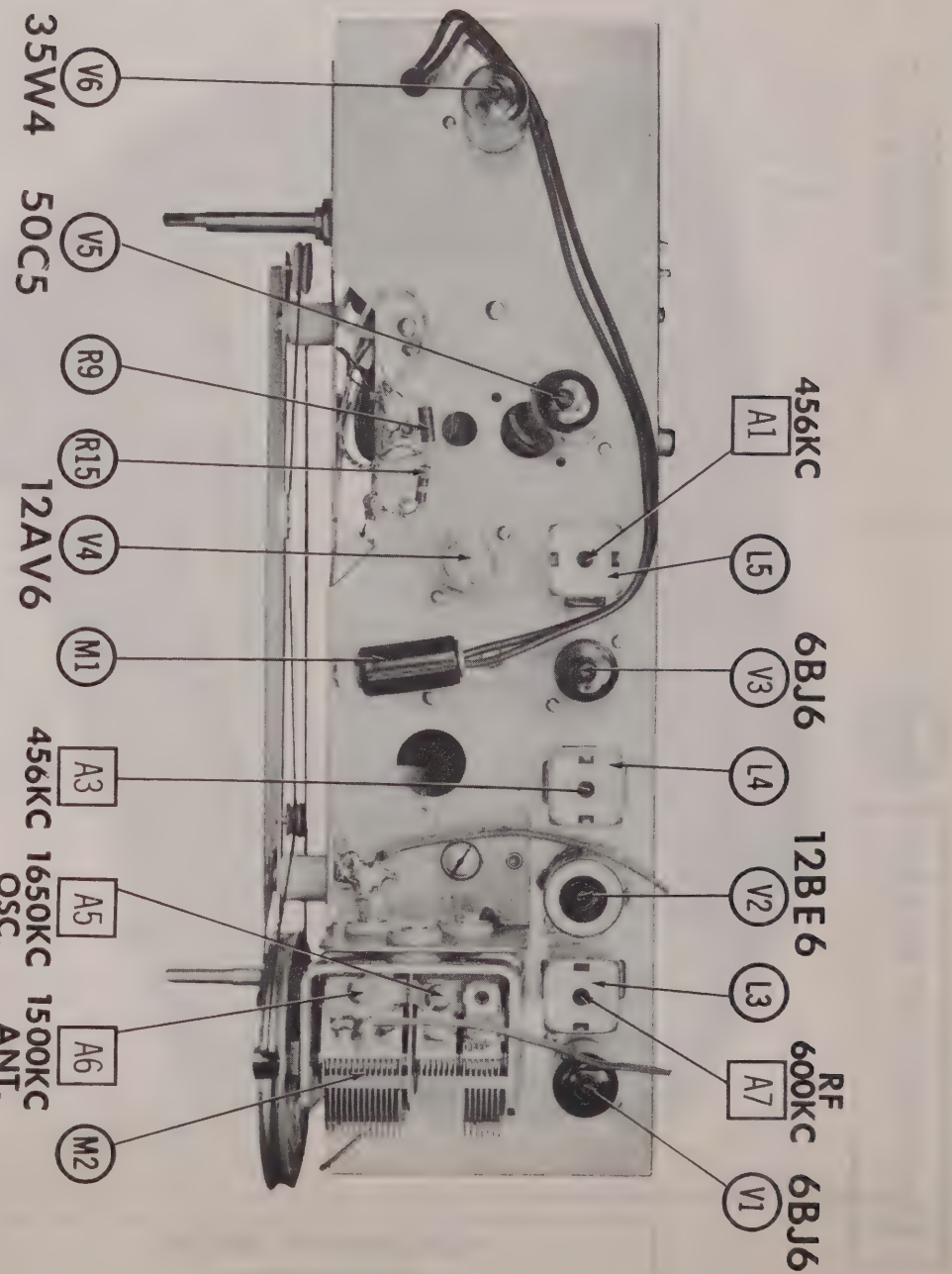
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	CORONADO PART No.	IRC PART No.	
R2	2.7Meg			BTS-2.7Meg	
R3	47Ω			BTS-47	
R4	22K		180-102	BTS-22K	
R5	1000Ω		180-106	BTS-1000	
R6	150Ω		180-111	BTS-150	
R7	2.7Meg			BTS-2.7Meg	
R8	5.6Meg			BTS-5.6Meg	
R9	150Ω		180-111	BTS-150	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	CORONADO PART No.	IRC PART No.	
R10	220K		180-105	BTS-220K	
R11	120K			BTS-120K	
R12	220K		180-105	BTS-220K	
R13	2200Ω 5%	2		BTB-2200 5%	
R14	150Ω		180-111	BTS-150	
R15	470Ω		180-156	BTS-470	
R16	1500Ω	1		BTA-1500	
R17	100Ω 5%		180-175	BTS-100 5%	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	CORONADO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	3200Ω tapped	3.4Ω	138-116	Z1105	A-3031	A-3336	24S50A	S-16X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	CORONADO PART No.	QUAM PART No.	
SP1	5" X 7"	PM	3-4Ω	175-127	57A1	
SP2	3 1/4"	PM	3-4Ω	175-128	3A15TZ3.4	

COILS (RF-IF)

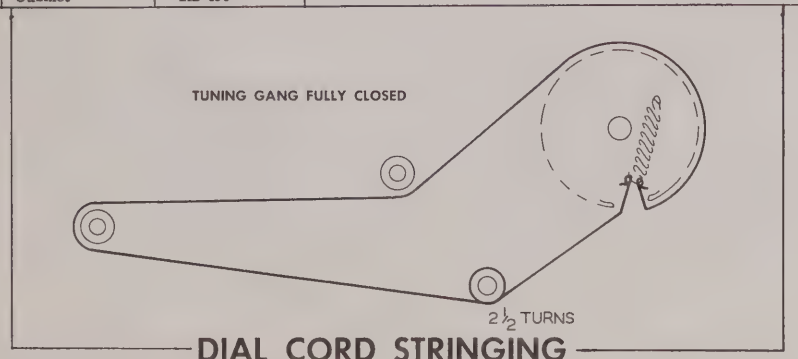
ITEM No.	USE	REPLACEMENT DATA				NOTES
		CORONADO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	134-109				
L2	RF Coil	130-113				
L3	Osc. Coil	136-131				
L4	Input IF	130-102	16-6758	BC-352	12-C1	
L5	Output IF	130-107	16-6758	BC-353	12-C2	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	CORONADO PART No.	REPLACEMENT DATA	
K1	Diode Filter	100MMF, 100MMF, 47K	166-107	Aerovox	PA-97-1
				Centralab	PC-50
				Cornell-Dubilier	111TM1
				Sprague	D-1

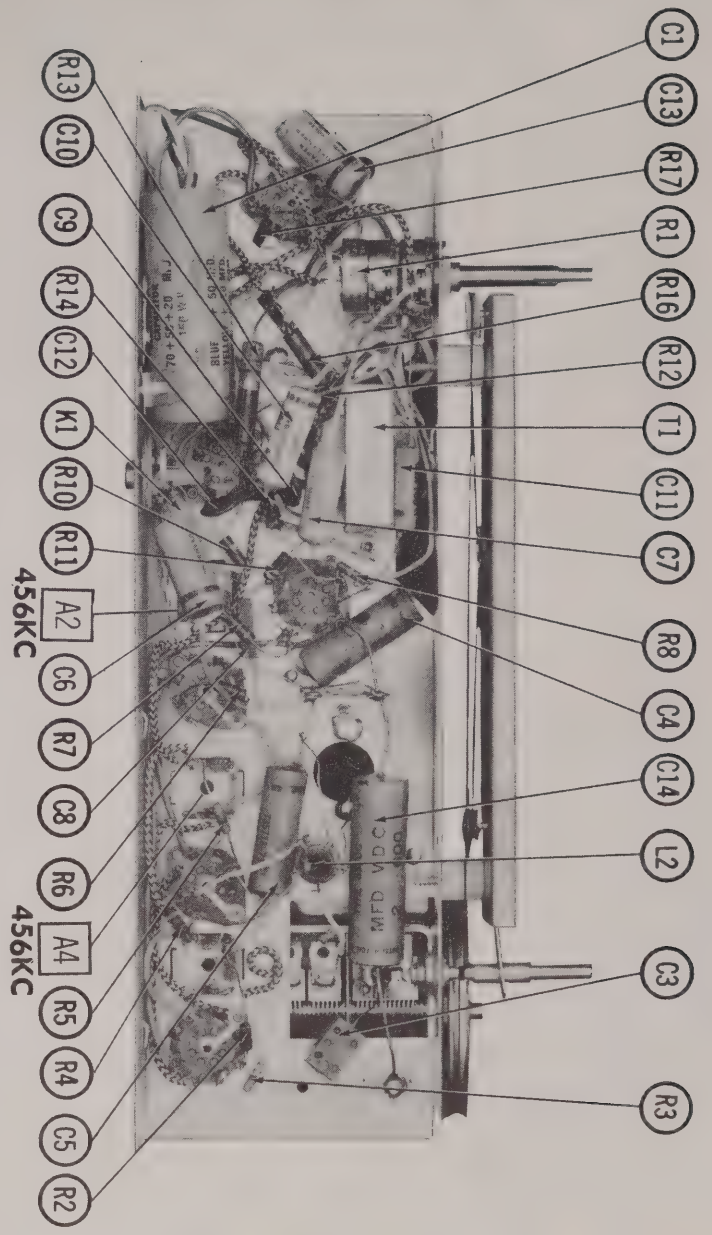
MISCELLANEOUS

ITEM No.	PART NAME	CORONADO PART No.	NOTES
M1	Pilot Light		#47
M2	Tuning Cap.	160-120	Three Gang (21-465MMF, 9-210MMF, 20-128MMF)
	Pointer	140-127	Dial
	Knob	220-131	Tuning
	Knob	220-129	Tone
	Knob	220-130	On-Off, Volume
	Cabinet	212-105	



DIAL CORD STRINGING

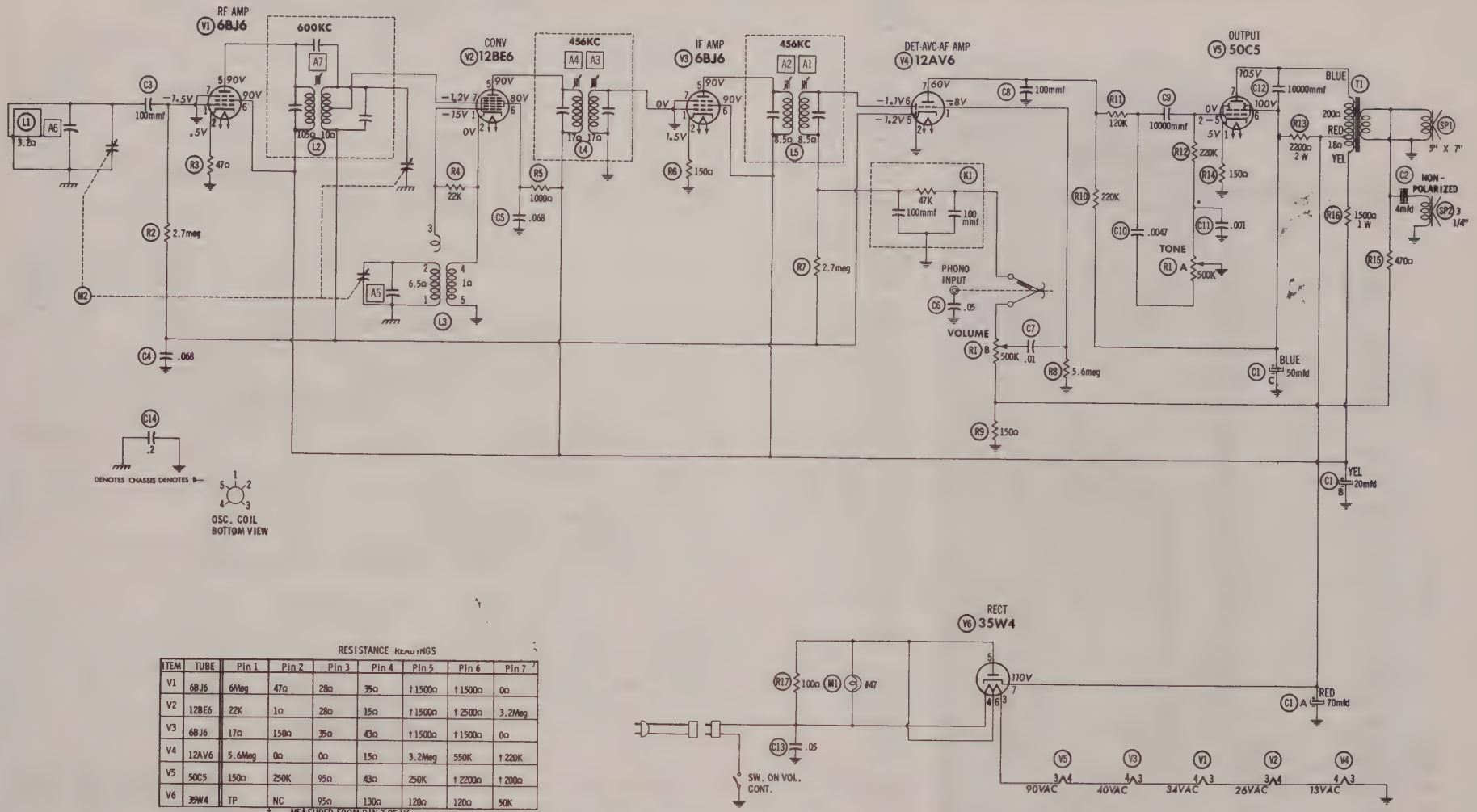
CHASSIS—BOTTOM VIEW



SET 356 FOLDER 5

CORONADO MODEL RA48-8352A

CORONADO MODEL RA48-8352A



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	6BJ6	6Meg	47Ω	28Ω	35Ω	†1500Ω	†1500Ω	0Ω
V2	12BE6	22K	1Ω	28Ω	15Ω	†1500Ω	†2500Ω	3.2Meg
V3	6BJ6	17Ω	150Ω	35Ω	43Ω	†1500Ω	†1500Ω	0Ω
V4	12AV6	5.6Meg	0Ω	0Ω	15Ω	3.2Meg	550K	†220K
V5	50C5	150Ω	250K	95Ω	43Ω	250K	†2200Ω	†200Ω
V6	35W4	TP	NC	95Ω	130Ω	120Ω	120Ω	50K

† MEASURED FROM PIN 7 OF V6.
NC NO CONNECTION
TP TIE POINT

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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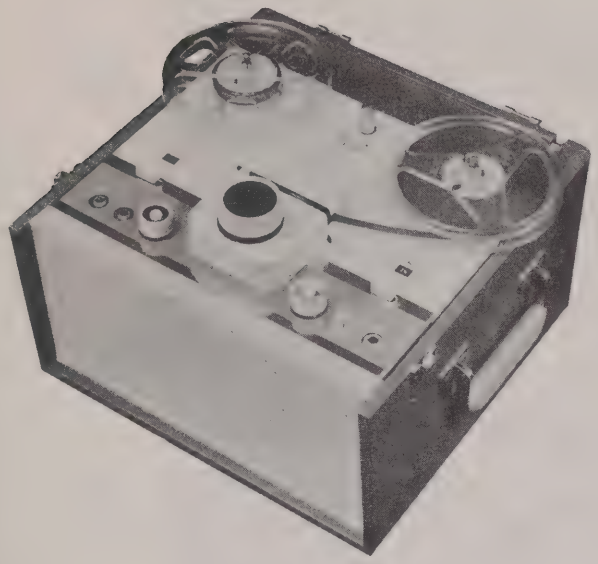
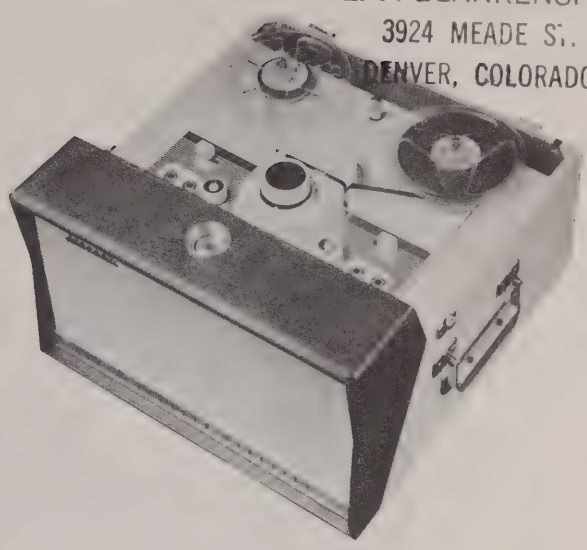
CRESCENT
MODELS TR-672, TR-673



TR – 672



TR – 673

CRESCENT
MODELS TR-672, TR-673

GENERAL INFORMATION

The Crescent Models TR-672 and TR-673 are mechanically alike. The major difference between the two models is the amplifiers used. Notice the difference in the schematic located toward the rear of this manual.

Models TR-672 and TR-673 are designed to record and playback two tracks of material on standard width recording tape, which doubles the recording and playing time with no loss of frequency response or quality. Recordings can be made from a radio, television receiver, or phonograph, in addition to those made directly from the microphone.

These recorders have two tape speeds, 3 3/4" and 7 1/2" per second. Using both tracks, the recording time is as follows:

Reel Size	3 3/4" Speed	7 1/2" Speed
5" (600 ft.)	1 hour	1/2 hour
7" (1200 ft.)	2 hours	1 hour

Models TR-672 and TR-673 are designed to operate on 60 cycles, 110-120 volts, AC supply only. Before connecting to your line supply, be absolutely certain that it agrees with the above specifications.

Manufactured by:

Crescent Industries, Inc.
5900 W. Touhy
Chicago 31, Illinois

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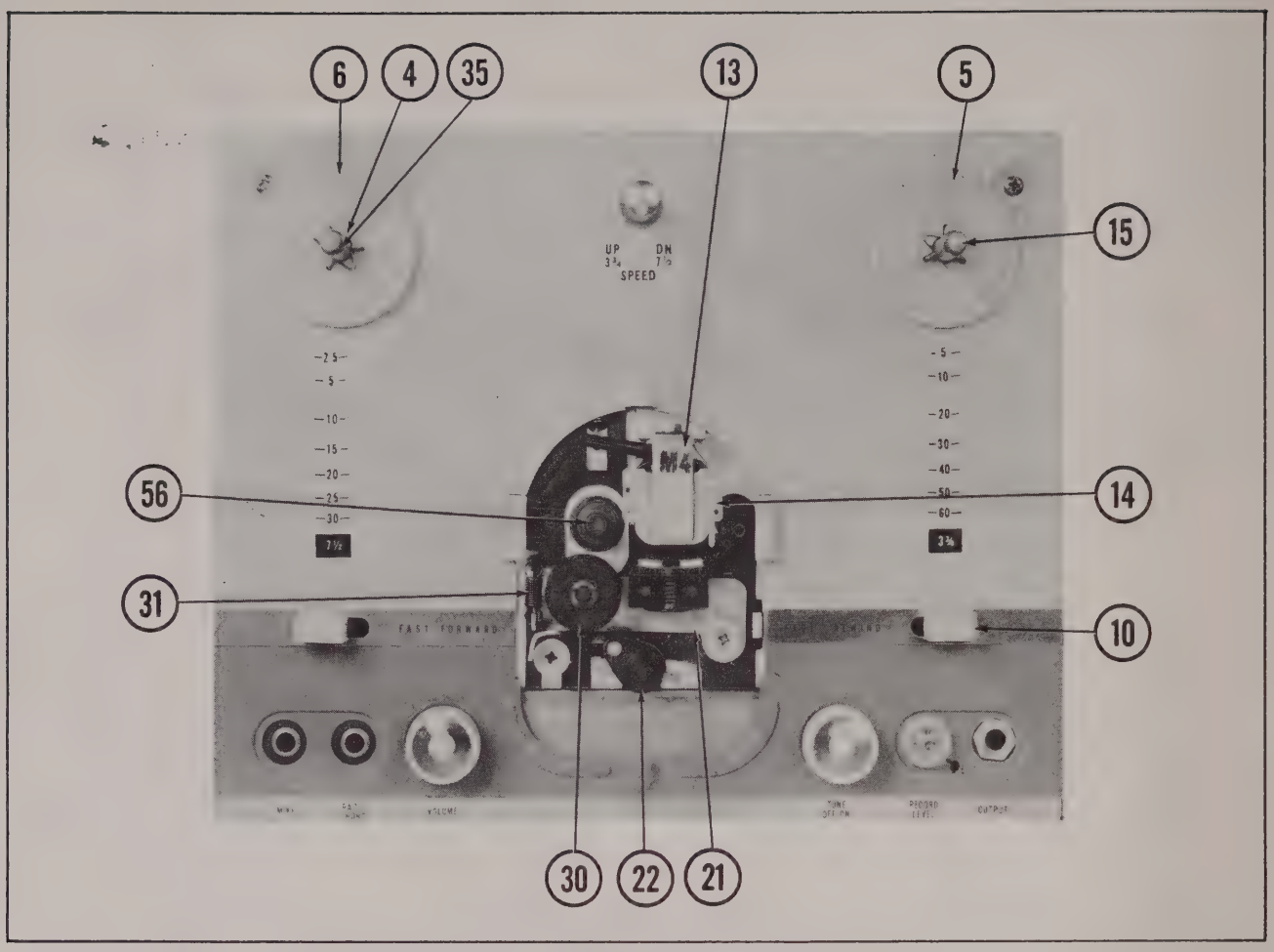

FIGURE 1

SPECIFICATIONS

Fast Forward Speed-

5" reel, 45 seconds
7" reel, 90 seconds

Fast Rewind Speed-

5" reel, 45 seconds
7" reel, 90 seconds

Frequency Response

3 3/4" speed, 65 to 6000 cycle per second.
7 1/2" speed, 65 to 8500 cycle per second.

Power Output-

2 watts undistored
3 watts maximum

Inputs-

Microphone, 1 Meg Impedance
Radio-Phono, .5 Meg Impedance

Bias & Erase Frequency-

50KC

OPERATING INSTRUCTIONS

Speed Control-

Changing speeds is accomplished by placing the speed button in the "Up" or "Down" position. "Up" for 3 3/4" per second and "Down" for 7 1/2" per second.

CAUTION: Do not operate in this control unless the On-Off control is in the "On" position.

Threading The Tape-

1. Place a reel of tape on the right reel plate (5) and an empty reel on the left reel plate (6) making sure the reel slots engage the pins on the reel plates.

2. Unwind about 12" of tape from the reel. Hold a section of the tape straight with both hands and insert the tape in the tape slot making sure the dull coated side faces the rear of the recorder.

3. Insert the free end of the tape into one of the three radial slots in the hub of the empty reel. Turn the reel several turns clockwise, until the tape is secured to the reel and all slack is taken up between reels.

To Record From Microphone-

1. Turn the On-Off-Tone Control clockwise until a click is heard and allow about thirty seconds for the tubes to warm up.

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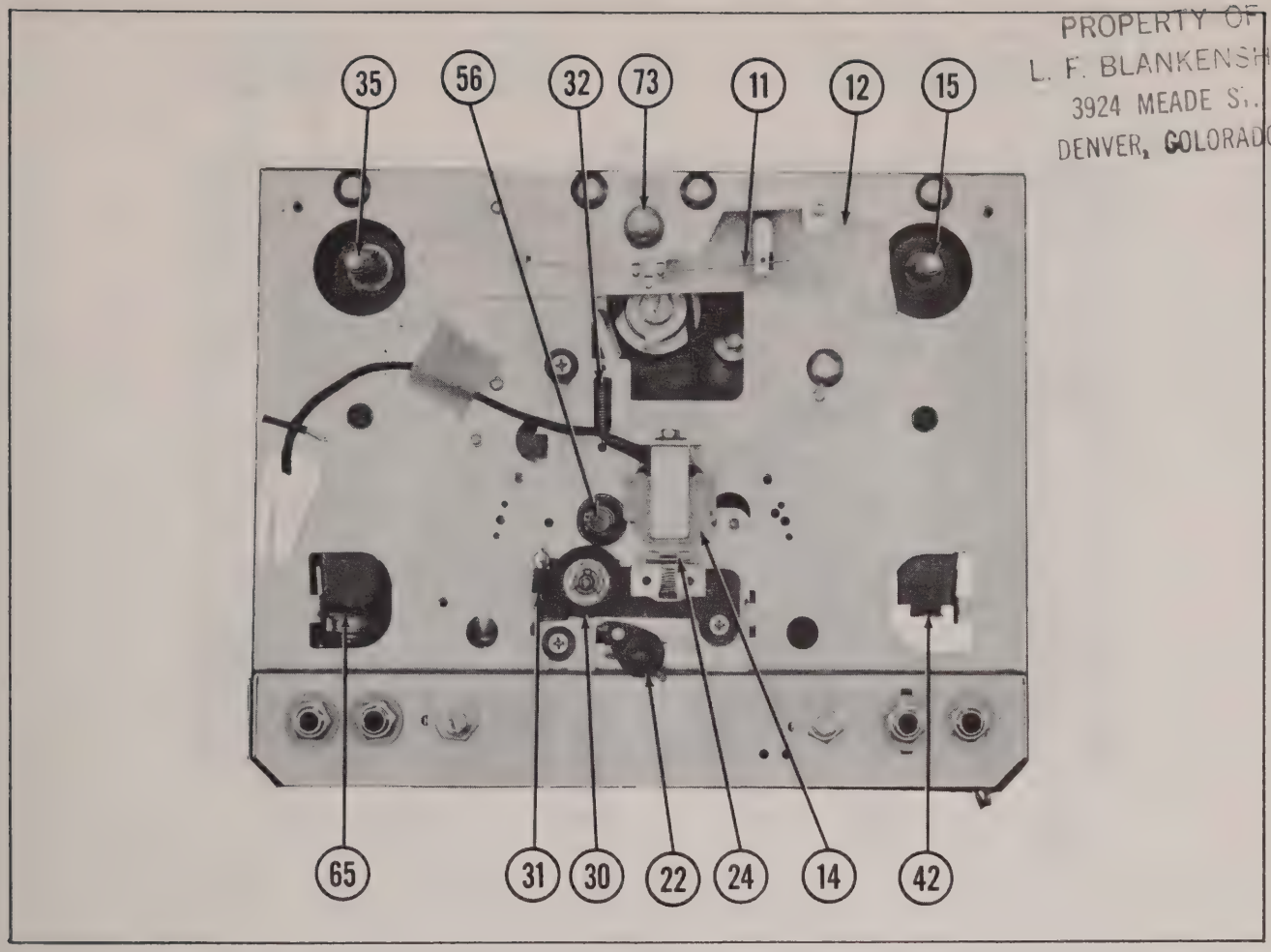

FIGURE 2

2. Insert the microphone plug into the "Mike" jack.

3. Depress the play-record control knob (2) as far as it will go, turn clockwise until it locks while holding it down.

4. Hold the microphone about six inches from your mouth and speak in a normal voice. Adjust the "Volume" control until the record level indicator flashes on the loudest sounds.

NOTE: Model TR673 recording level indicator is a "magic eye" indicator tube. The indicator is located directly in front of the Play-Record Knob. A "V" shaped area on the eye (visible only during recording) marks the volume of sound being recorded. For undistored reproduction, the tape recorder volume control should be set, while recording, so that the "V" on the indicator tube almost closes for extremely loud passages only. The "V" should never completely close or fold over (Overlap).

To Record From Radio-

Recordings from a radio may be made by one of three ways:

1. Place the microphone about 6" to 12" in front of the radio speaker. Turn the radio volume control to a normal level. Setting it too high will cause distortion. Turn the radio tone control to maximum treble. Set the recording level and proceed with recording as described under "To Record From Microphone". This type of recording may not be satisfactory as other sounds may be picked up by the microphone which as a result will be recorded on the tape.

2. Have a shielded cable made up with a two conductor phone plug on one end and two alligator clips on the other end. Connect the alligator clips across the voice coil terminals on the radio speaker and insert the cord plug into the "Radio-Phono" jack. Set the radio volume and tone controls as described above. Set the recording level and proceed as described under "To Record From Microphone".

3. Have a shielded cable with a two conductor phone plug on one end and the other end connected across the radio volume control. Insert the phone plug into the "Radio-Phono" jack. Set the recording level and proceed with the recording as described under "To Record From Microphone". The position of the radio volume and tone controls has no effect on this set up and may be set anywhere.

To Record From Phonograph-

1. If the phonograph being used has a phono type plug on the pickup leads, insert it into the "Radio-Phono" jack. Set the recording level and proceed with the recording as described under "To Record From Microphone".

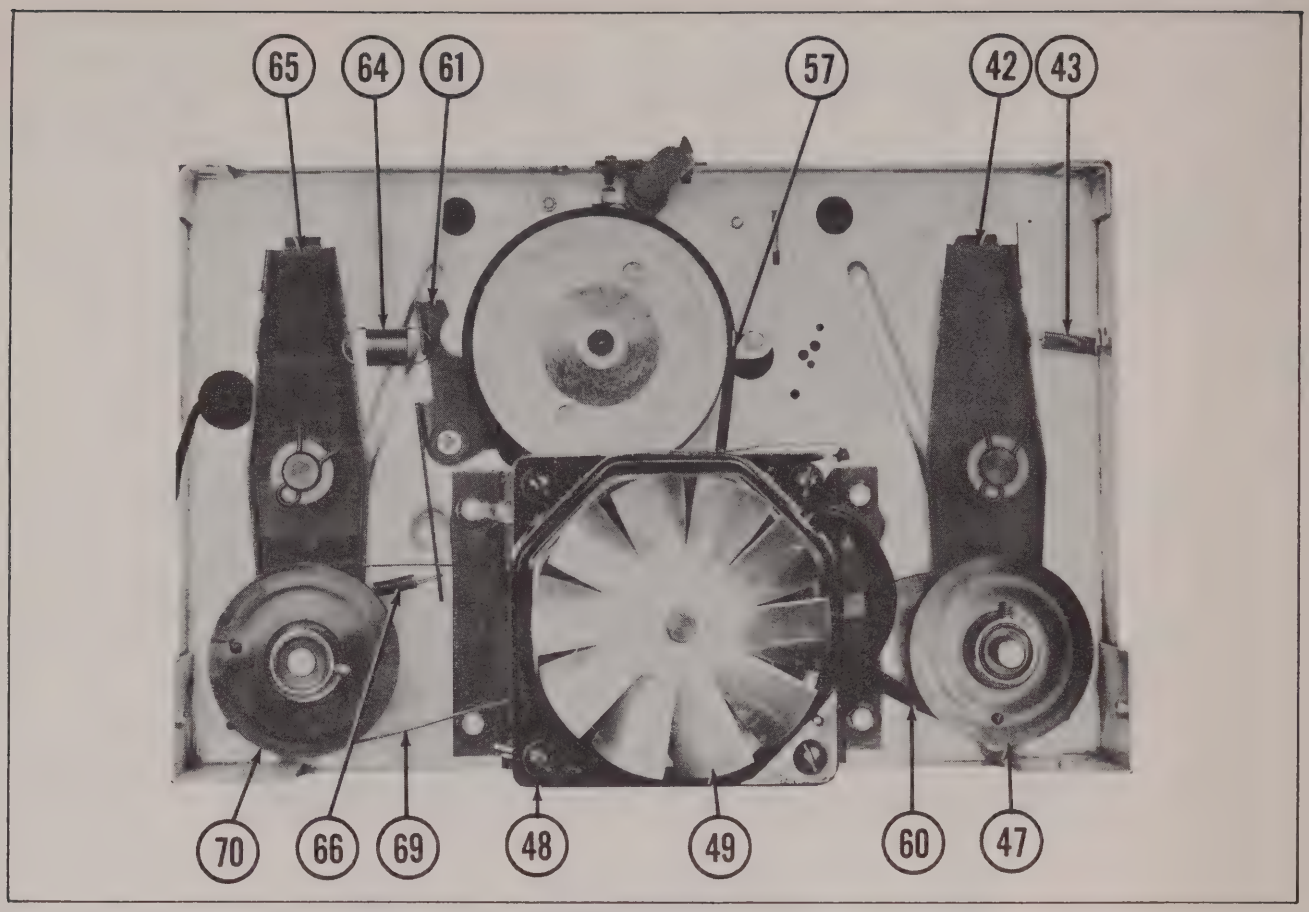

FIGURE 3

To Record From Television Receiver-

1. Use one of the three methods described under "To Record From Radio" and proceed with the recording as described under "To Record From Microphone".

2. If the phonograph has a standard pin type plug which is more common, an adaptor is needed. Insert the pin plug into the adaptor and plug the adaptor into the "Radio-Phono" jack.

IMPORTANT: The recorder will not record from microphone or playback while a plug is inserted in the "Radio-Phono" jack.

Dual Track Recording-

The Crescent is designed so that only one-half the tape width is recorded at a time; thereby resulting in two track recording. This two track operation is accomplished in the following manner:

1. After a reel of tape has been recorded, i.e. all of the tape wound on to the take-up reel, turn the play-record control (2) to idle.

2. Remove the reels from the recorder, turning the full reel over and placing it on the right reel plate (5) and the empty reel on the left reel plate (6).

3. Properly thread the tape and proceed with the recording.

4. After this track has been recorded the first track of recording is ready to be played without rewinding, by reversing the reels as described in Step 2 above.

Fast Forward And Fast Rewind-

High-speed forward or reverse can be obtained by pressing the desired knob (10) toward the head cover. Movement of these controls will wind the tape on the desired reel at a high speed as long as the control is held in this position. These are used primarily in locating a desired portion of a recording in a few seconds.

CAUTION: Do not attempt "Fast Forward" or "Fast Rewind" with the play-record control (2) on anything but idle position, as damage to the unit or breaking of the tape may result.

Braking-

1. The Crescent Tape Recorder contains an automatic brake mechanism (12), which eliminates the necessity for hand braking.

2. To "Stop" tape at anytime — when operating the recorder on fast forward or fast rewind — merely release the forward or rewind control. The tape will automatically come to a stop.

To Play A Recording-

1. Thread tape as described under "Threading the Tape".

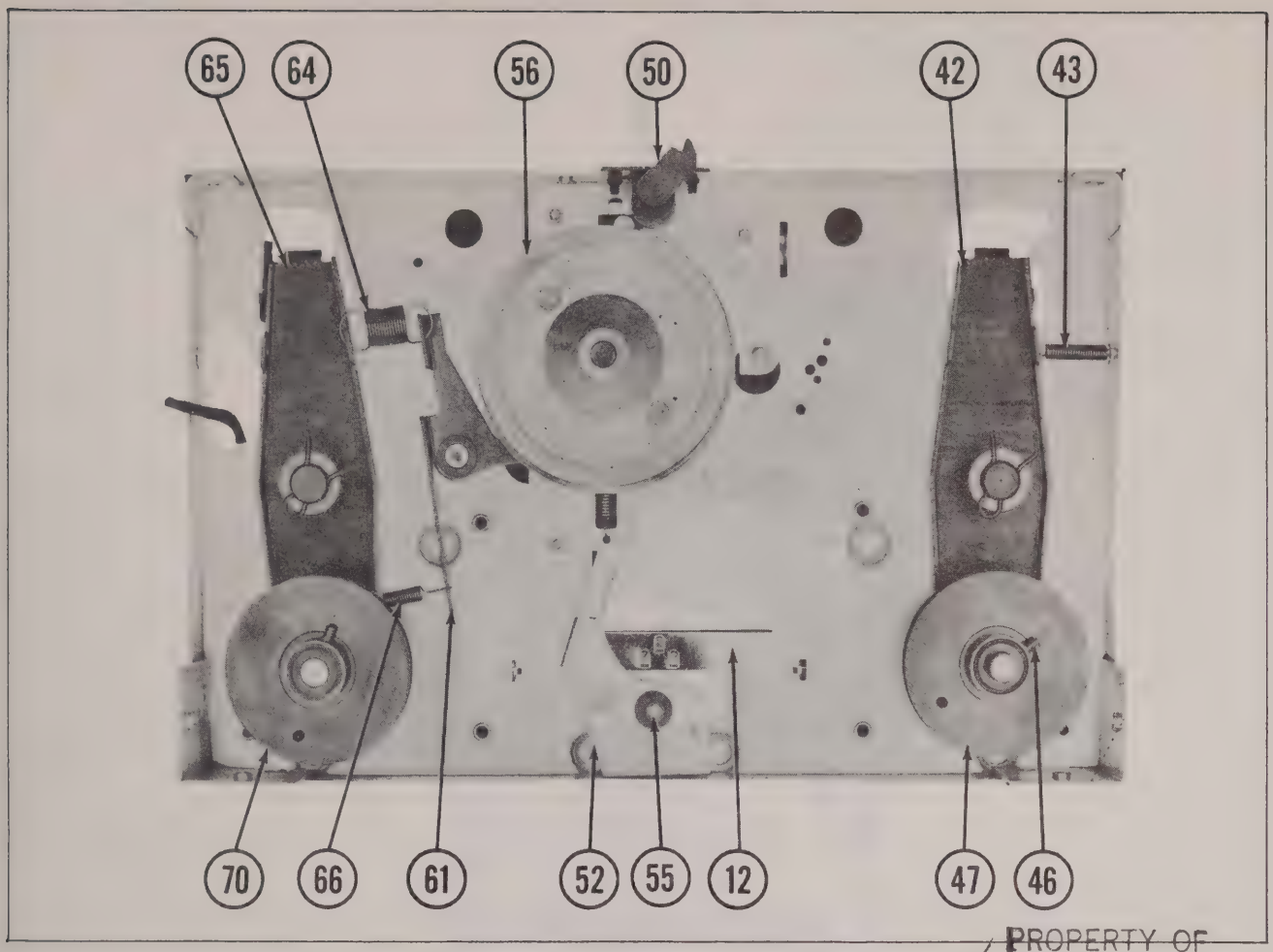

FIGURE 4

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2. Turn play-record control (2) clockwise without depressing until it locks.

3. Adjust the "Volume" and "Tone" controls for desired listening level.

To Use An Ext. Speaker-

Plug external speaker thru a three conductor plug into "Output Jack."

CAUTION: Do not connect three conductor plug into output jack without a speaker attached to the plug; as damaged to the output tube transformer and tone control may result.

To Edit And Splice Tape-

NOTE: Since it is impossible to edit and splice one track without affecting the other, recordings which are to be edited should be limited to one track only.

1. The tape may be edited by cutting out unwanted portions, or by joining selections into another sequence. Announcements may be inserted between selections, etc. Unused sections of tape can be spliced together for re-use.

2. For best results, cut tape at a slight diagonal, join ends together with splicing tape on the glossy side and trim off any excessive width.

Erasing Recorded Material-

In the record position any recording on the tape is automatically erased before a new recording is put on the tape. If it is desired to erase a recording without putting anything on the tape follow the normal recording procedure, but leave the "Volume" control set at its extreme counterclockwise position.

To Use As A Public Address System-

1. Insert the microphone plug into the "Radio-Phono" jack.

2. Leave the play-record control (2) in idle position.

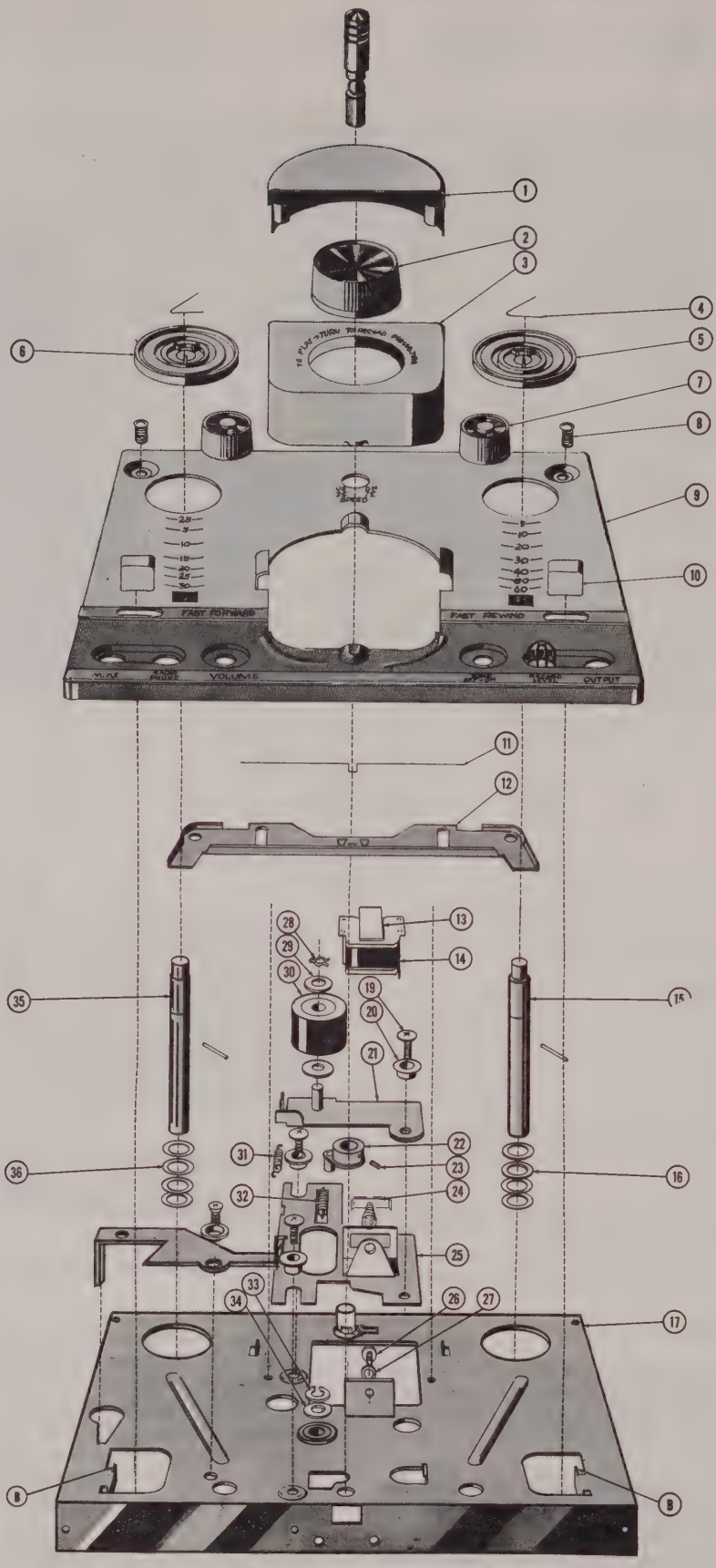
3. Speak into the microphone and adjust the "Volume" and "Tone" controls for desired level.

4. Do not have microphone too close to the speaker or a feedback howl will result.

ADJUSTMENTS

Removing Unit From Case-

All service work except cleaning of the head and pressure roller and adjustment of the head and pressure pad assembly requires removal of the unit from the carrying case.



A PHOTOFACT "EXPLODED" VIEW
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FIGURE 5A. EXPLODED VIEW OF PARTS ABOVE BASEPLATE.

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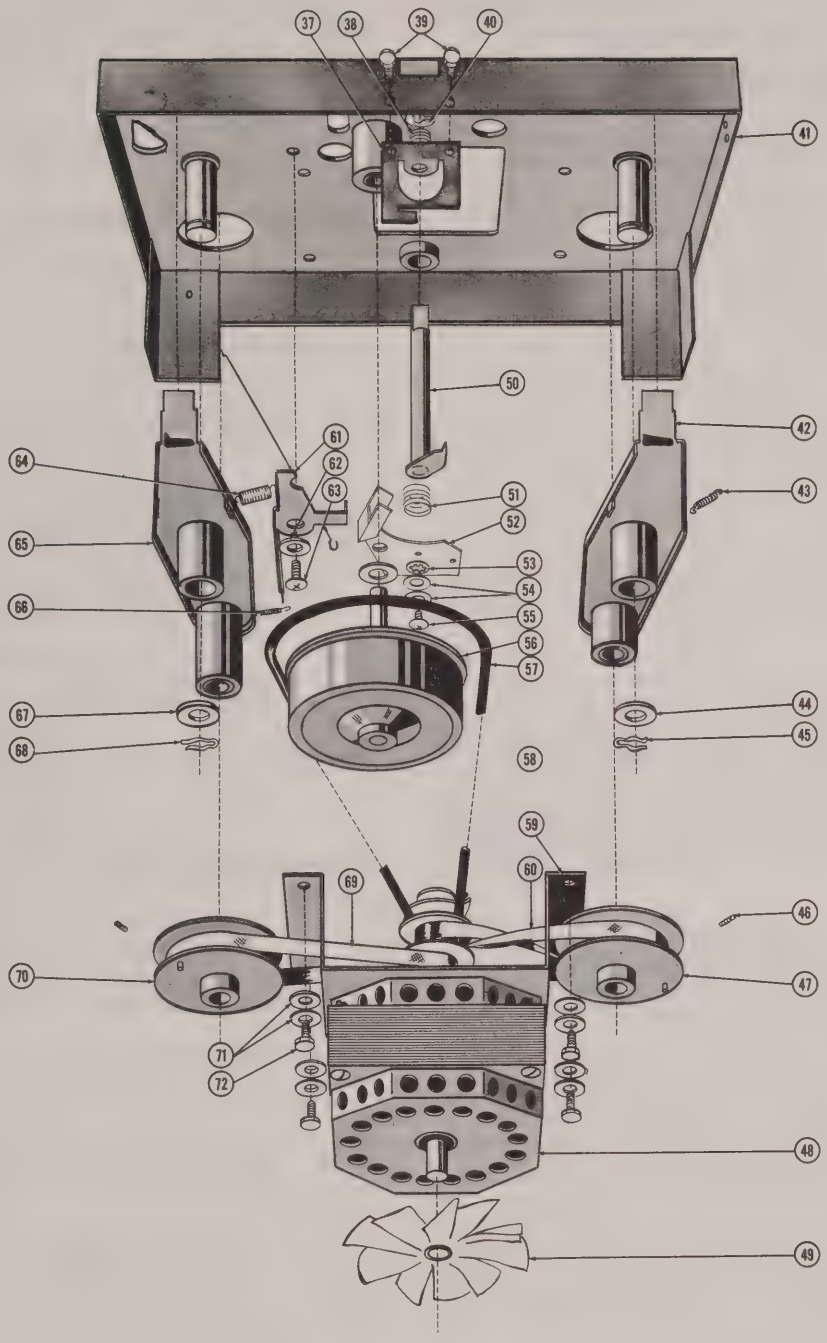

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FIGURE 5B. EXPLODED VIEW OF PARTS BELOW BASEPLATE.

1. To remove unit from carrying case, remove the four Phillips head screws from bottom of case and carefully lift unit straight up and out.

Spindle (15 and 35) End Play Adjustments-

The spindle should have from 1/32" to 1/16" of up and down movement. Loosen the set screw in the pulley (47 and 70) and move the pulley up or down until the correct amount of end play is obtained.

Lifter Arm (22) Adjustment-

This adjusts the distance that the contact strip on the play-record switch will move when going into the record position. If an adjustment is necessary depress and turn the play-record control (2) clockwise. Loosen set screw in the lifter arm (22) and rotate control knob (2) to the left or right to center the contact strip with the contacts on the left end of switch. Make sure lifter arm (22) is down as far as it will go and tighten its set screw.

Play-Record-Erase Head Adjustment-

It is very important that the head be lined up perfectly with the tape. If it is not, low output, loss of high frequencies or track overlap may result. If the head is to be replaced, the complete assembly of the head and bracket (14) that it mounts in should be changed. The bracket is adjusted to the head and sealed in place at the factory. There are two adjustments to be made which are as follows:

1. One is the head height. This is set by placing a 1.79 gauge (between 11/64" and 3/16") on the motorboard (17) under where the head is mounted. The head is pushed down flush with this gauge and tighten in place and the gauge removed. If a gauge is not obtainable set the head height while the unit is pulling tape. Move the head slowly up until the top edge of the tape is hitting edge of the tape guides on the motorboard.

2. The second adjustment is for output and frequency response. To set this make a recording of a 3000 cycle signal on a good unit. Place this on the unit that the head is to be aligned on. Connect an output meter or AC voltmeter across the speaker voice coil. Play the 3000 cycle tape, rock the head holder (13) back and forth, screw (26) holding the holder on to the motorboard bracket will allow you to do this, and notice the variation in the output voltage at the voice coil. Tighten the head holder in the position of the highest output. Make sure the head was not moved up or down while rocking it. If a 3000 cycle signal tape cannot be made, record a record with some high notes on it on another recorder. Play this back on the recorder to be adjusted and rock the head to give best high note response.

After setting the height and output check recorder for track overlap. To do this take a reel of tape that has no recording on it. Make a recording on the recorder that the head has been adjusted on. Do not rewind but take the reels off, reverse them and play the other track. There should be no sound heard. If what was recorded is heard backwards there is track overlap. If this is the case, the guide on the head holder should be bent up to move the track further apart.

If tube V1 or V2 is replaced or the head changed the setting of the hum balance pot (R3) should be checked. To do this, connect an external speaker to the unit as described under "To Use An External Speaker". Connect an AC voltmeter with a .1volt AC scale across the speaker voice coil. Turn the "Volume" and "Tone" controls clockwise. Place the play-record control (2) in "Play" position. Put the AC meter on the .1 volt scale and adjust the hum pot (R3), which is located between tubes V1 and V2 on top of the chassis, to its minimum reading. It should not exceed .1 volt. This is the only adjustment required in the amplifier.

TROUBLES

Won't Take Up Tape Properly-

1. Spindle (35) binding.
   (a) Lubricate.

2. Improper take up spring (64).
   (a) Replace spring.

3. Belt (69) slipping.
   (a) Clean motor pulley and pulley (70).

4. Belt (69) broken.
   (a) Remove bracket (59) and replace belt.

5. Set screw loose in pulley (70).
   (a) Tighten and leave 1/32" to 1/16" end play in spindle.

6. Pulley (70) broken.
   (a) Replace pulley.

Fast Forward Won't Function Properly-

1. See above except for step 2.

Fast Rewind Won't Function Properly-

1. Spindle (15 and 35) binding.
   (a) Lubricate.
2. Belt (60) slipping.
   (a) Clean motor pulley and pulley (47).

3. Belt (60) broken.
   (a) Remove bracket (59) and replace belt.

4. Set screw loose in pulley (47).
   (a) Tighten and leave 1/32" to 1/16" end play in spindle.

5. Pulley (47) broken.
   (a) Replace pulley.

Speed Variation Or Wow-

1. Slippage.
   (a) Clean motor pulley, flywheel and capstan (56) and pressure roller (30) with a petroleum solvent, not carbon tetrachloride. Replace rubber rollers if they appear oil soaked.

2. Flat spot on rubber roller (30).
   (a) A rapid thumping sound while the unit is running may indicate a flat spot on the rubber tire. If this condition does not clear up after several minutes of running time, replace the roller.

(b) If the surface of the rubber roller is not smooth and even, replace the part.

(c) Should the bearings of the roller show signs of excessive wear or be extremely wobbly, the roller should be replaced.

3. Tight feed or take up spindle (15 or 35).
   (a) Check adjustment as described under "Spindle End Play Adjustment".

   (b) Lubricate.

4. Tight pressure roller (30).
   (a) Lubricate

5. Tight flywheel shaft (56).
   (a) Lubricate.

Stalling Or Binding-

1. Speed control setting changed while unit not turned on. This should be done only when motor is running.
   (a) With motor turned "On", try moving speed control up and down several times.

Should the above fail, try holding the fast forward control (10) to the left as far as it will go and with the other hand manually rotate take-up reel spindle (35). If binding still continues it will be necessary to remove unit from case and free any binding action.

Speed Does Not Agree With Speed Setting-

1. Broken "ears" on motor drive pulley.
   (a) Replace entire motor.

Tape Creeps Out Of Tape Slot-

1. Head (14) improperly adjusted.
   (a) See "Play-Record-Erase Head Adjustment".

LUBRICATION

The lubricant applied at time of manufacture should be sufficient for a long period of time. Approximately once a year, or in the event that parts are replaced, lubricate the unit as follows:

With No. 20 Motor Oil-

1. Take up reel arm (65) bushing.

2. Feed reel arm (42) bushing.

3. Spindle (15 and 35) bearings.

4. Flywheel (56) bearings.

5. Pressure roller (30) bearing.

With Staput No. 312 Grease Or Lubriplate-

1. Pressure plate (25) at the slide buttons and the guide on the right side.

2. On the stud of the lifter arm (22).

CAUTION: Do not oil the motor bearings unless absolutely necessary as excess oil will only be thrown off and cause slipping of the pulleys and rollers. Always use as little oil as possible. If oil should get on the pulleys and rollers wipe off with a petroleum solvent, such as alcohol. Do not use carbon tetrachloride.

CLEANING

The record-playback head (14), capstan shaft and pressure roller (30) are subject to an accumulation of tape coating residue, which is worn off the tape as it passes these parts. This can cause distortion, weak output and poor erasure. Use a soft cloth and alcohol to clean the head surfaces, capstan and pressure roller.

CAUTION: Do not use a brush or any metallic object when cleaning the record-playback head as this could possibly mar the head surface.

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Mixer& Playback Preamp.	12AU7A	
V2	AF Amplifier	12AX7	
V3	Output-Bias Oscillator	6V6GT	
V4	Rectifier	6X5GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	CRESCENT PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲40	300	770088	AFH4-47	B0450	FP217.87	TMT-23	D-130	TVL-4575
B	■40	300			BR4035	TC78		FM-450	
C	▲40	300							
C2	25	25	770003	PRS25V25	BBR25-25	TC26	TD-25-25	FM-0225	TVA-1205

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	CRESCENT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C3	20000			BPD-02	DD-203	K085	ED-02		5HK-S2	
C4	20000			BPD-02	DD-203	K085	ED-02		5HK-S2	
C5	470									
C6	10000									
C7	750									
C8	20000			BPD-02	DD-203	K085	ED-02		5HK-S2	
C9	470									
C10	75			BPD-000068	DD-750	G039	ED-75	UC-5475	5GA-Q75	
C11	470			BPD-00047	DD-471	G060	ED-470	UC-5347	5GA-T47	
C12	2000			BPD-002	DD-202	K072	ED-002	DC-522	5HK-002	
C13	2000			BPD-002	DD-202	K072	ED-002	DC-522	5HK-002	
C14	3000			1467-003					MS-23	
C15	470			BPD-00047	DD-471	G060	ED-470	UC-5347	5GA-T47	
C16	20000			BPD-02	DD-203		ED-02		5HK-S2	
C17	75			BPD-000068	DD-750	G039	ED-75	UC-5475	5GA-Q75	
C18	.01	400		BPD-01	DD-103	CUB4S1	ED-01	GEM-411	4TM-S1	
C19	.01	400		BPD-01	DD-103	CUB4S1	ED-01	GEM-411	4TM-S1	

CONTROLS

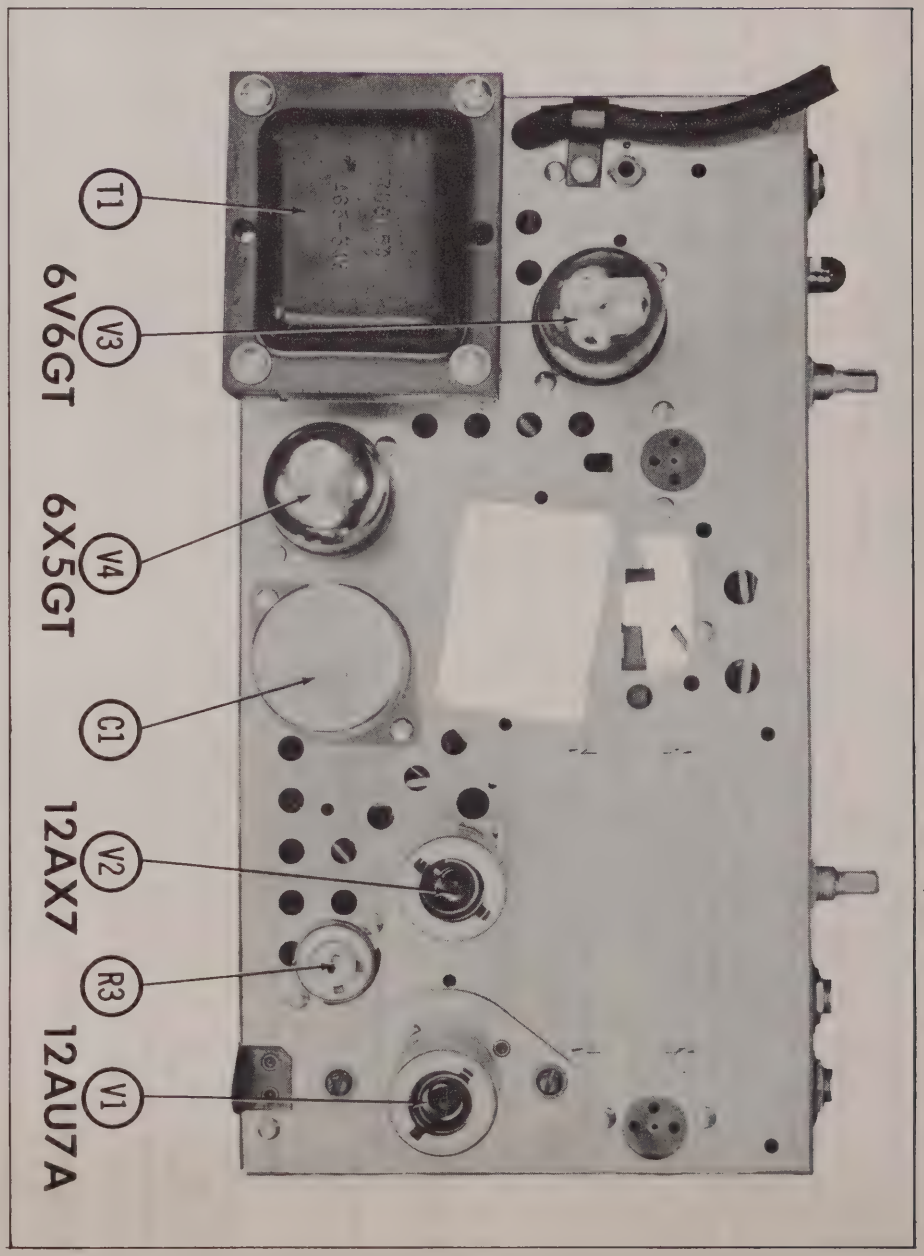
ITEM No.	RATING RESISTANCE	RATING WATTS	CRESCENT PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	740051	AB-60	A47-500K-Z	Q13-133	U48	Volume
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	
R2A	500K	½	740052	AB-60	A47-500K-Z	Q13-133	U48	Tone
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	
C	Switch			KB-1	SWE-12	76-1	US-26	
R3A	200Ω	2	740045					Hum Balance Wirewound

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	CRESCENT PART No.	IRC PART No.	NOTES
R4	1Meg			BTS-1Meg	
R5	470K			BTS-470K	
R6	220K			BTS-220K	
R7	4700Ω			BTS-4700	
R8	470K			BTS-470K	
R9	220K			BTS-220K	
R10	4700Ω			BTS-4700	
R11	150K			BTS-150K	
R12	68K			BTS-68K	
R13	270K			BTS-270K	
R14	100K			BTS-100K	
R15	1500Ω			BTS-1500	
R16	220K			BTS-220K	
R17	100K			BTS-100K	
R18	2200			BTS-2200	
R19	270Ω	1		BTA-270	
R20	5.6Meg			BTS-5.6Meg	
R21	560K			BTS-560K	
R22	2.2Meg			BTS-2.2Meg	
R23	15K			BTS-15K	
R24	10K			BTS-10K	
R25	47K			BTS-47K	
R26	1Meg			BTS-1Meg	
R27	470K			BTS-470K	
R28	1000Ω	5		PW7-1000	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COILS

ITEM No.	USE	REPLACEMENT DATA				NOTES
		CRESCENT PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Bias Oscillator					

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	CRESCENT PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @ 78A	510VCT @ .040A	6.3V @ 1.7A		700054	P9205 ① ②	P-3048	PM-8403 ① ②	22R00 ① ②	R-83 ① ②

① Tape 5V Winding;
② Tape Center Tap On 6.3V Winding.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	CRESCENT PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	5.6KΩ	3-4Ω	700055	Z1003 ① ②	A-2930	A-3877	24S51	S-3X	① Drill one new mtg. hole. ② Use secondary lugs 1 & 3

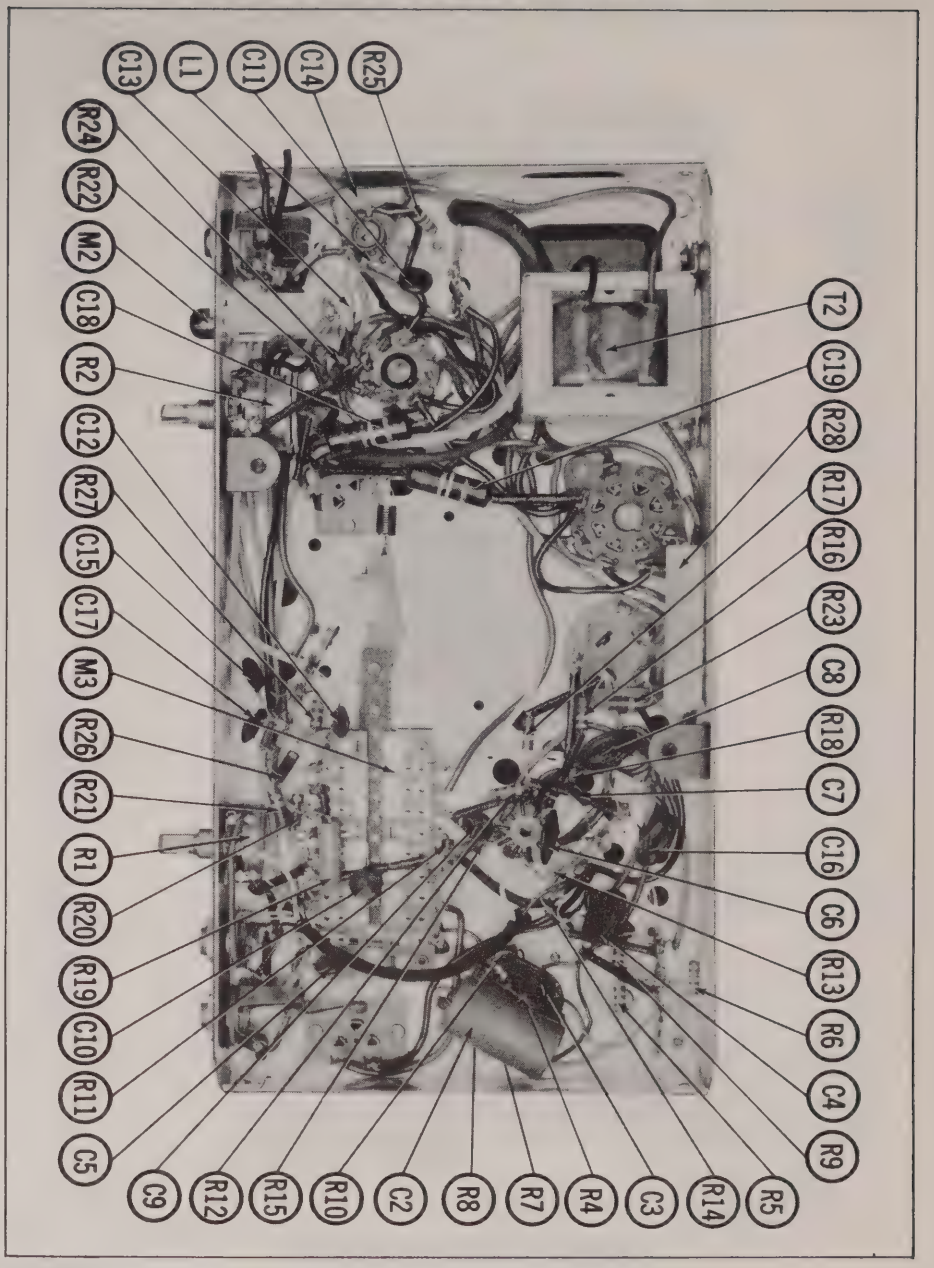
SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	CRESCENT PART No.	QUAM PART No.	
SP1	5 1/4"	PM	3-4Ω	011298	52A1	

MISCELLANEOUS

ITEM No.	PART NAME	CRESCENT PART No.	NOTES
M1	Head	011311	Record-Erase, Includes Head Holder, Cable And Plug
M2	Lamp	730006	Neon NE51
M3	Switch		Record-Play (2 Position - Slide Type)
M4	Motor	011326	
	Knob	310371	Record-Play
	Knob	310354	On-Off-Volume, Tone
	Knob	310358	Fast Forward, Rewind

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Mike & Playback Preamp.	12AU7A	
V2	AF Amplifier	12AX7	
V3	Output Bias Oscillator	6V6GT	
V4	Record Indicator	6E5	
V5	Rectifier	6X5GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA CRESCENT PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	≈40	300	770088	AFH4-47	B0450	FP217-87	TMT-23	D-130	TVL-4575
B	≈40	300			BR4035	TC78		FM-4540	
C	40	300							
C2	25	25	77003	PRS25V25	BBR25-25	TC26	TD-25-25	FM-0225	TVA-1205

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA CRESCENT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C3	20000			BPD-02	DD-203	K085	ED-02		5HK-S2	
C4	20000			BPD-02	DD-203	K085	ED-02		5HK-S2	
C5	470									
C6	10000			BPD-01	ED-01	K082	ED-01	DC-511	5HK-S1	
C7	750									
C8	20000			BPD-02	DD-203	K085	ED-02		5HK-S2	
C9	470									
C10	470									
C11	39									
C12	470			BPD-00047	DD-471	G060	ED-470	UC-5347	5GA-T47	
C13	20000			BPD-02	DD-203	K085	ED-02		5HK-S2	
C14	2000			BPD-002	DD-202	K072	ED-002	DC-522	5HK-D2	
C15	2000			BPD-002	DD-202	K072	ED-002	DC-522	5HK-D2	
C16	1000			1467-001					MS-21	Note 1
C17	470									
C18	20000			BPD-02	DD-203	K085	ED-02		5HK-S2	
C19	10000			BPD-01	DD-103	K082	ED-01	DC-511	5HK-S1	
C20	10000			BPD-01	DD-103	K082	ED-01	DC-511	5HK-S1	

Note #1. Some versions may use a 3000MMF in this application.

CONTROLS

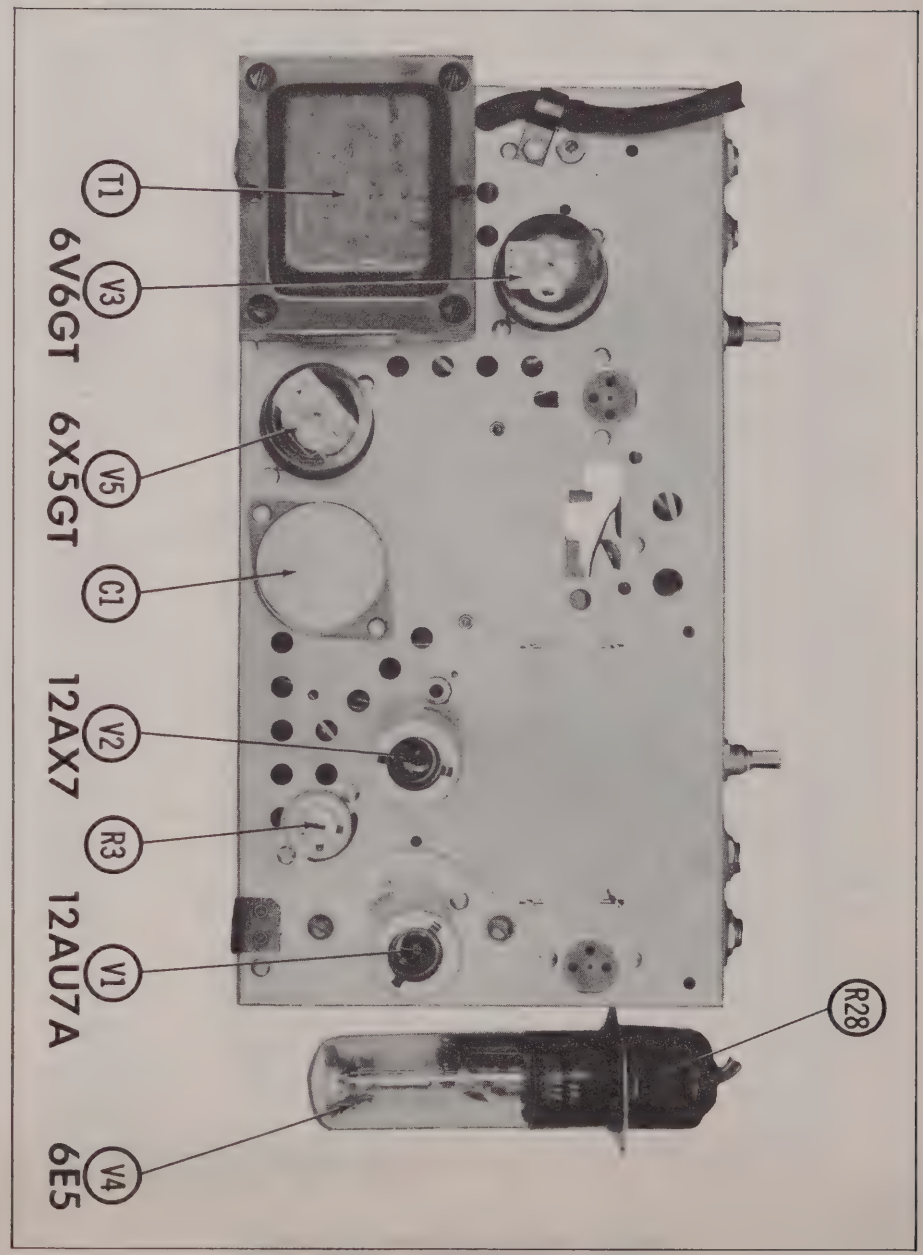
ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA CRESCENT PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	740051	AB-60	A47-500K-Z	Q13-133	U48	Volume
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	
R2A	500K	½	740052	AB-60	A47-500K-Z	Q13-133	U48	Tone
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	
C	Switch			KB-1	SWE-12	76-1	US-26	
R3A	200Ω	2						Hum Balance

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA CRESCENT PART No.	IRC PART No.	NOTES
R4	1Meg			BTS-1Meg	
R5	220K			BTS-220K	
R6	470K			BTS-470K	
R7	4700Ω			BTS-4700	
R8	470K			BTS-470K	
R9	220K			BTS-220K	
R10	4700Ω			BTS-4700	
R11	150K			BTS-150K	
R12	68K			BTS-68K	
R13	270K			BTS-270K	
R14	100K			BTS-100K	
R15	1500Ω			BTS-1500	
R16	220K			BTS-220K	
R17	100K			BTS-100K	
R18	2200Ω			BTS-2200	
R19	15K			BTS-15K	
R20	10K			BTS-10K	
R21	270Ω	1		BTA-270	
R22	47K			BTS-47K	
R23	470K			BTS-470K	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R24	2.2Meg			BTS-2.2Meg	Note 1
R25	220K			BTS-220K	
R26	2.2Meg			BTS-2.2Meg	Note 1

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R27	1Meg			BTS-1Meg	
R28	1Meg			BTS-1Meg	
R29	1000Ω	7		PW7-1000	

Note #1. A 2Meg ⓐ ½ W Resistor Used In Some Versions.

COILS

ITEM No.	USE	REPLACEMENT DATA CRESCENT PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Bias Osc.					
L2	50KC Trap					

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	SEC. 1	SEC. 2	SEC. 3	REPLACEMENT DATA CRESCENT PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC ⓐ .88A	560VCT ⓐ .046A	6.3V ⓐ 1.95A		70069	P9205 ① ②			22ROK① ②	R-8B ① ②

① Tape 5V Winding.
② Tape Center Tap On 6.3V Winding.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA CRESCENT PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	5KΩ	3-4Ω tap ⓐ 2Ω	70007I						

SPEAKER

ITEM No.	TYPE SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA CRESCENT PART No.	QUAM PART No.	NOTES
SP1	6"	PM	3-4Ω	011701 ①	6A15 ①	① Connect in parallel & phase.
SP2	6"	PM	3-4Ω	011701 ①	6A15 ①	

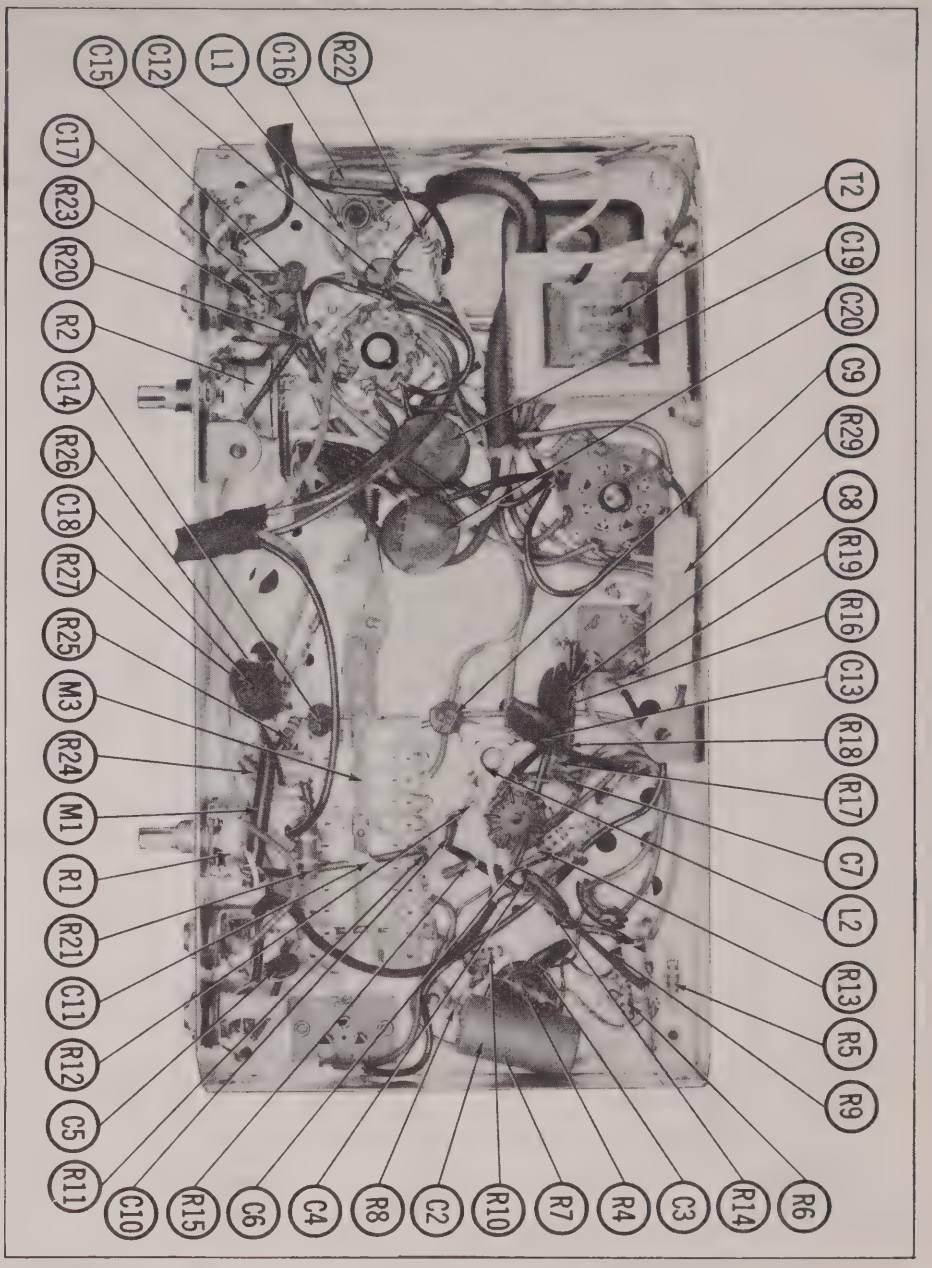
SELENIUM DIODES

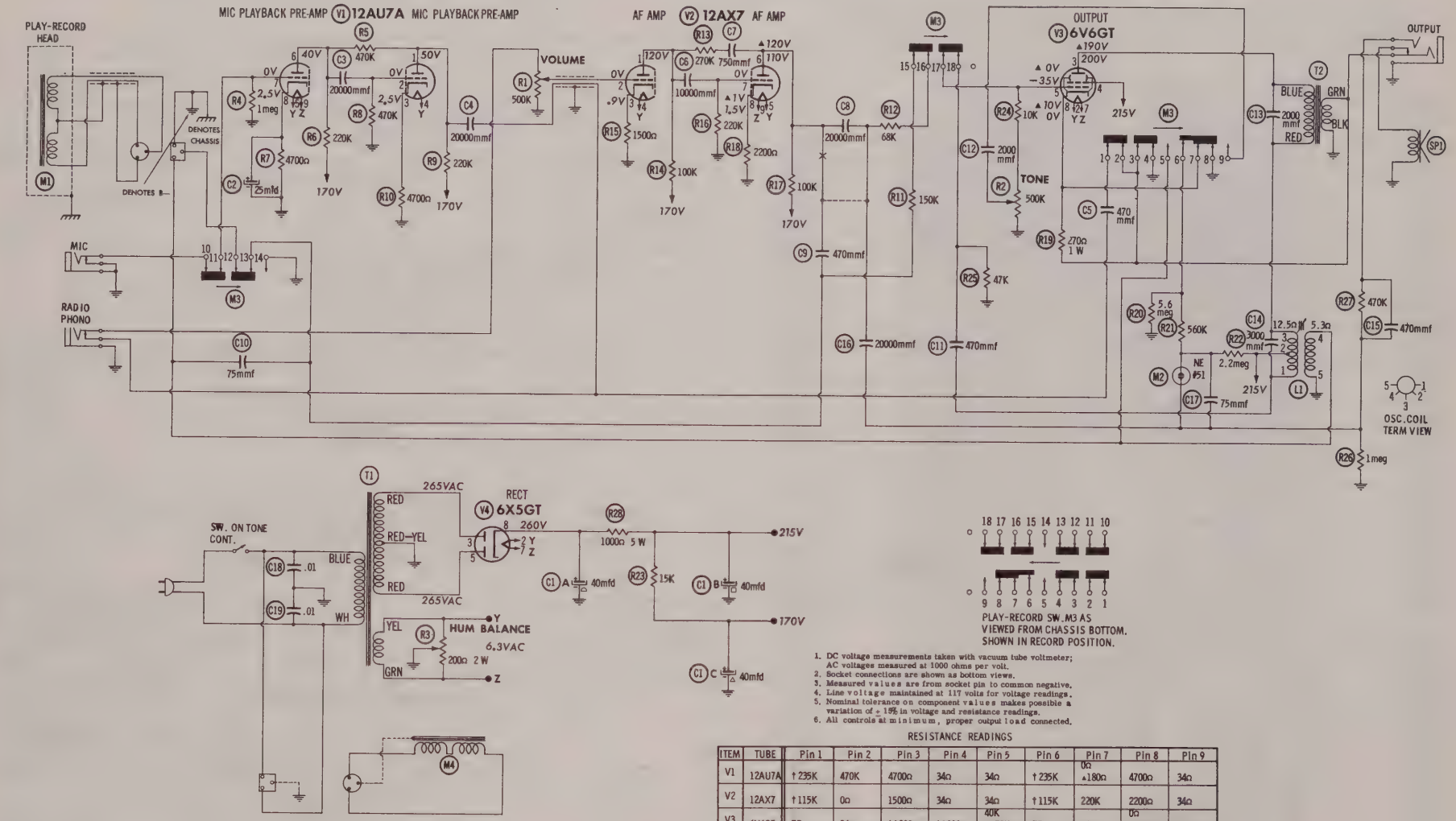
ITEM No.	RATING CURRENT	REPLACEMENT DATA CRESCENT PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	NOTES
M1				1T1				Bias Rectifier, Record Level Indicator

MISCELLANEOUS

ITEM No.	PART NAME	CRESCENT PART No.	NOTES
M2	Head	011311	Record Erase - Includes Head Holder, Cable And Plug
M3	Switch		Record - Playback (2 Position - Slide Type)
M4	Motor	011326	
	Knob	310372	Play Record
	Knob	310355	On-Off Volume, Tone
	Knob	310357	Fast Forward, Rewind

CHASSIS—BOTTOM VIEW





1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AU7A	†235K	470K	4700Ω	34Ω	34Ω	†235K	0Ω ▲180Ω	4700Ω	34Ω
V2	12AX7	†115K	0Ω	1500Ω	34Ω	34Ω	†115K	220K	2200Ω	34Ω
V3	6V6GT	TP	34Ω	†1200Ω	†1000Ω	40K ▲ 570K	TP	34Ω	0Ω ▲ 270Ω	
V4	6X5GT	TP	34Ω	450Ω	TP	500Ω	NC	34Ω	100K	

† MEASURED FROM PIN 8 OF V4.
ALL MEASUREMENTS TAKEN IN RECORD POSITION UNLESS OTHERWISE NOTED.
▲TAKEN IN "PLAY" POSITION.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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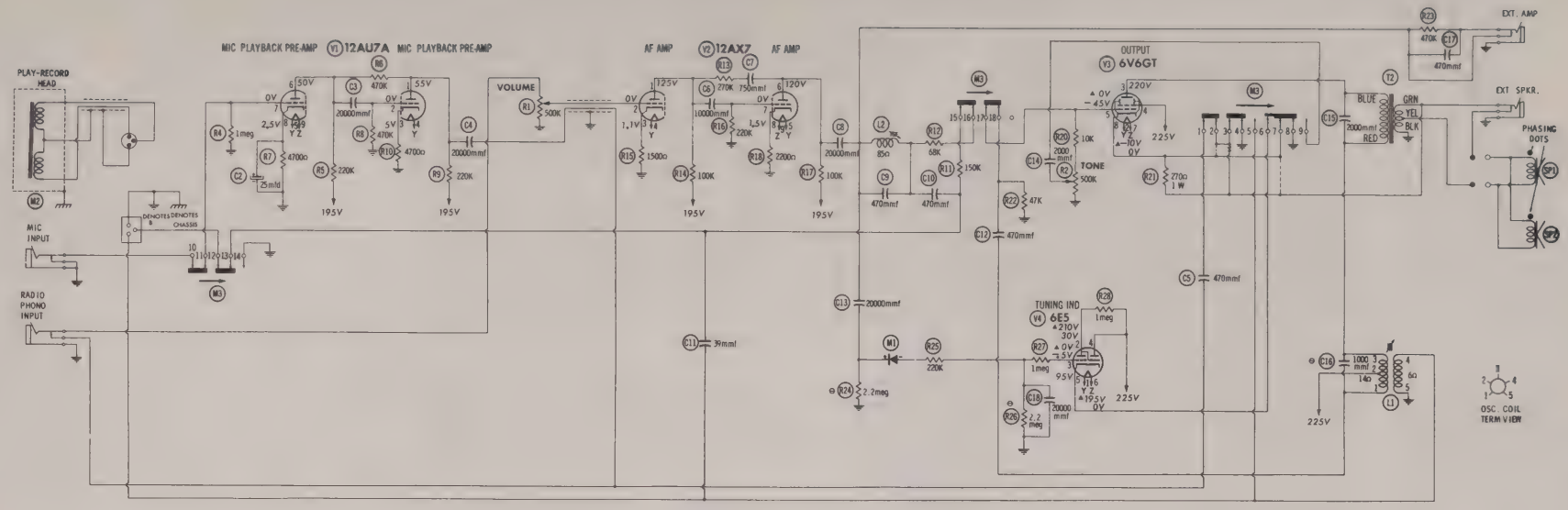
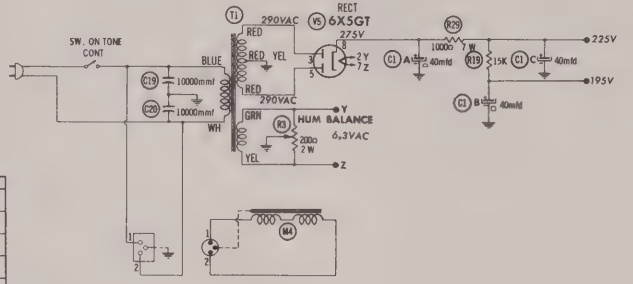
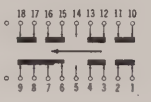
SCHEMATIC MODEL TR-672.







PLAY-RECORD SW. M3 AS VIEWED FROM CHASSIS BOTTOM. SHOWN IN RECORD POSITION

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AU7A	↑235K	470K	4700Ω	46Ω	46Ω	↑235K	0Ω ▲180Ω	4700Ω	46Ω
V2	12AX7	↑116K	0Ω	1500Ω	46Ω	46Ω ▲ 44K	↑116K	220K	2200Ω	46Ω
V3	6V6GT	TP	46Ω	↑1400Ω	↑1000Ω	▲ 350K	TP	46Ω	0Ω ▲270Ω	
V4	6E5	46Ω	↑1Meg	3.3Meg	↑1000Ω	0Ω ▲ INF	46Ω			
V5	6X5GT	TP	46Ω	380Ω	TP	410Ω	NC	46Ω	150K	

ALL MEASUREMENT TAKE IN "RECORD" POSITION UNLESS OTHERWISE NOTED.
↑ MEASURED FROM PIN 8 OF V5.
▲ MEASURED IN "PLAY" POSITION.

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SCHEMATIC MODEL TR-673.

CRESCENT
MODELS TR-672, TR-673

MECHANICAL PARTS LIST

Ref. No.	Part No.	Description
1	100780-037	Head Cover (Model TR-672)
	100780-035	Head Cover (Model TR-673)
2	310371	Play-Record Knob (Model TR-672)
	310372	Play-Record Knob (Model TR-673)
3	450154	Cover (Model TR-672)
	450155	Cover (Model TR-673)
4	460165	Retainer For Reel Holder (2)
5	012687	Reel Holder (Rewind) Model TR-672
	012104	Reel Holder (Rewind) Model TR-673
6	012687	Reel Holder (Take-up) Model TR-672
	012704	Reel Holder (Take-up) Model TR-673
7	310380	Volume And On-Off-Tone (Model TR-672)
	310381	Volume And On-Off-Tone (Model TR-673)
8	600242	Top Plate Mounting Screws (2)
9	450151	Top Plate (Model TR-672)
	450170	Top Plate (Model TR-673)
10	310358	Fast Forward And Rewind Knobs (Model TR-672)
	310357	Fast Forward And Rewind Knobs (Model TR-673)
11	420177	Brake Plate Spring
12	100880	Brake Plate
13		Head Holder
14	011311	Head; Includes Head Holder Cable And Plug
15	011319	Feed Spindle, Includes Roll Pin
16	580141	Washers
17	012383	Baseplate
18	101015	Foot Switch Lever
19	600243	Screw (4)
20	200288	Slide Button Washer (4)
21	012328	Pressure Roller Arm
22	012330	Pusher Stud
23	600247	Set Screw
24	011316	Pressure Shoe; Includes Felt Pads
25	012327	Pressure Plate Assembly
26	600137	Screw; Retains Head
27	580056	Washer
28	460111	Pressure Roller Retainer
29	580143	Cloth Washer (2)
30	011236	Pressure Roller
31	420174	Capstan Pressure Spring
32	420171	Slide Plate Return Spring
33	460018	Capstan And Flywheel Retainer
34	580141	Capstan And Flywheel Washer
35	011319	Take-Up Spindle; Includes Roll Pin
36	580141	Washer
37	100660	Control Shaft Bracket
38	420109	Record Release Spring
39	600111	Control Shaft Screw
40	460117	Control Shaft Retainer
41	012383	Baseplate
42	011330	Rewind Arm
43	420173	Spindle Arm Spring
44	580156	Washer
45	460110	Retainer
46	600247	Set Screw
47	011317	Spindle Pulley
48	011326	Motor
49	011321	Fan
50	012324	Control Shaft
51	420151	Two Speed Control Spring
52	100760	Speed Control Bracket
53	380019	Lockwasher
54		Washer
55	600242	Screw
56	011694	Capstan Shaft And Flywheel
57	490087	Rubber Belt
58		Motor Pulley (Part Of Motor)
59	011739	Motor Mounting Bracket
60	490089	Rewind Drive Belt
61	100809	Take-Up Lever
62	200288	Slide Button Washer
63	600243	Screw
64	420186	Take-Up Spring
65	011329	Take-Up Arm
66	420172	Brake Spring
67	580156	Washer
68	460110	Retainer
69	490089	Take-Up Drive Belt
70	011317	Spindle Pulley
71	680056	Washers
72	600256	Screw
73	420181	Foot Switch Return Spring
74	200403	Foot Switch Adjust Cam
75	580082	Retainer

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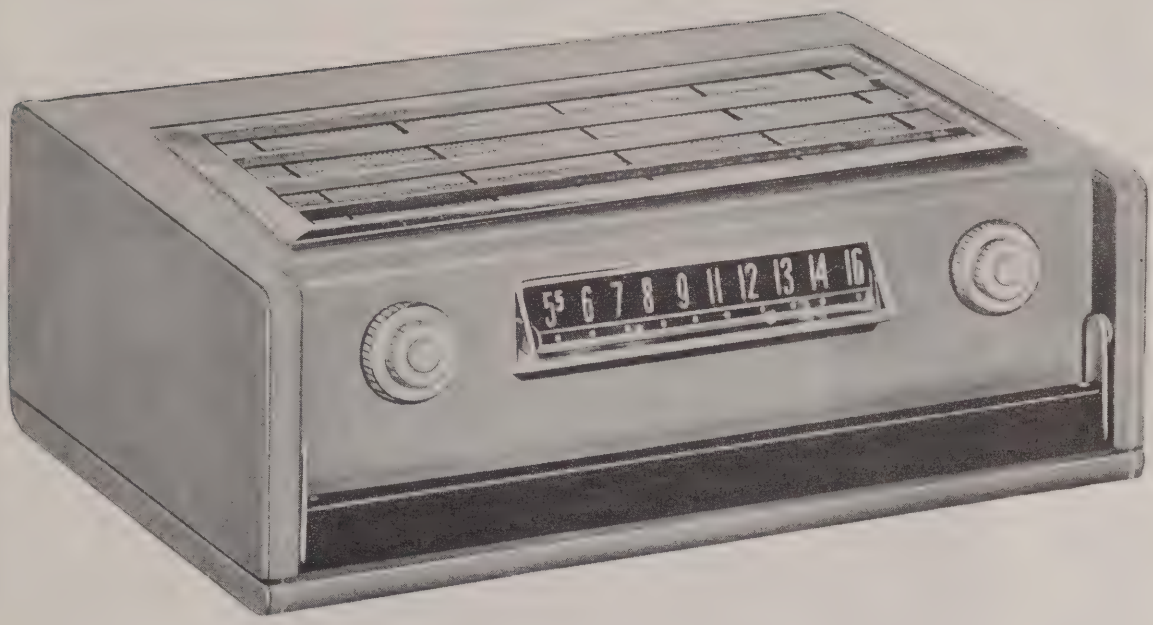
DENVER, COLORADO

FIRESTONE MODEL 4-C-34
(Code 382-7-40900)



FIRESTONE MODEL 4-C-34
(Code 382-7-40900)

TRADE NAME	Firestone Model 4-C-34 (Code 382-7-40900)
SUPPLIER	Firestone Tire & Rubber Co., 1200 Firestone Parkway, Akron, Ohio
TYPE SET	Battery Operated Portable AM Transistorized Receiver
POWER SUPPLY	7.5 Volts DC Positive Supply 1.5 Volts DC Negative Supply
RATING	6MA @ 7.5 Volts DC 2MA @ 1.5 Volts DC
TUNING RANGE—BROADCAST	540KC - 1670KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD	High side to antenna stator lug on tuning gang. Low side to chassis.	455KC (400~ Mod)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.		Loop	1670KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal.	"	A6	"

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."

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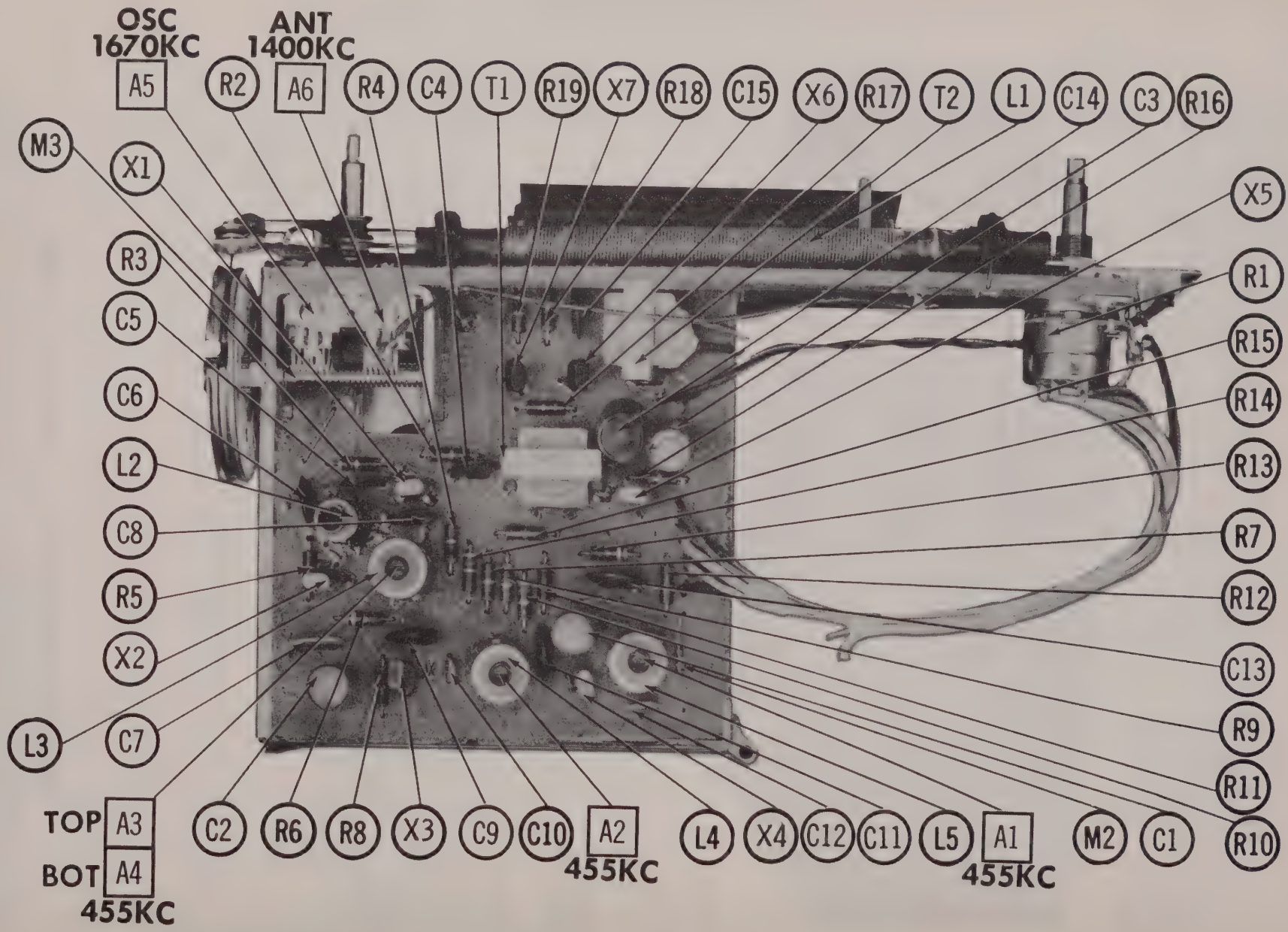


CHASSIS TOP VIEW

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	USE	TYPE	NOTES
X1	Mixer	2N212	
X2	Oscillator	2N211	
X3	1st IF Amplifier	2N94	
X4	2nd IF Amplifier	2N94	
X5	AF Amplifier	2N35	
X6	Output	2N214	
X7	Output	2N214	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	FIRESTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	10	10	44279-3	SRE25V10	BBR10-25	TC22	ML10-15	MMT-0210	TE-1114
C2	50	10	44279-2	SRE12V50	BBR50-15	TC29			R2279*
C3	50	10	44279-2	SRE12V50	BBR50-15	TC29			R2279*

* Non catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	FIRESTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C4	20000			BPD-02	DD-203	K085	ED-02		5HK-S2	
C5	20000			BPD-02	DD-203	K085	ED-02		5HK-S2	
C6	20000			BPD-02	DD-203	K085	ED-02		5HK-S2	
C7	2000			BPD-002	DD-202	K072	ED-002	DC522	5HK-D2	
C8	20000			BPD-02	DD-203	K085	ED-02		5HK-S2	
C9A	20000		43956	BPD-2X02	DD-203	K085	ED-02		5HK-2S2	
B	20000				DD-203	K085	ED-02			
C10	9					Z017				
C11A	20000		43956	BPD-2X02	DD-203	K085	ED-02		5HK-2S2	
B	20000				DD-203	K085	ED-02			
C12	24				TCZ-24	Z025	TCO-24			
C13	50000			BPD-05						
C14	.1	200		P288N-1	DF-104	CUB2P1		ACE401	2SE-P1	Note 1
C15	20000			BPD-02	DD-203	K085	ED-02		5HK-S2	

Note 1 Some versions may use .22MFD in this application

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	FIRESTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2200Ω		43816				UF252L	Tone
B	2200Ω						UR252L	Volume
C	Switch						US-27	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	FIRESTONE PART No.	IRC PART No.	
R2	2200Ω			BTS-2200	
R3	470Ω			BTS-470	
R4	1000Ω			BTS-1000	
R5	1000Ω			BTS-1000	
R6	3900Ω 5%			BTS-3900 5%	
R7	1000Ω			BTS-1000	
R8	820Ω 5%			BTS-820 5%	
R9	1000Ω			BTS-1000	
R10	1800Ω			BTS-1800	
R11	1000Ω			BTS-1000	
R12	220Ω			BTS-220	
R13	3900Ω 5%			BTS-3900 5%	
R14	47K			BTS-47K	
R15	220Ω			BTS-220	
R16	1200Ω			BTS-1200	
R17	5600Ω 5%			BTS-5600 5%	
R18	82Ω			BTS-82	
R19	10Ω			BTS-10	

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (INPUT)

ITEM No.	RESISTANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	FIRESTONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	540Ω	230Ω CT	43865						
	Turns Ratio								
	2.5 : 1								

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	FIRESTONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	700Ω CT	3-4Ω	43864				TR-29		

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	FIRESTONE PART No.	QUAM PART No.	
SP1	5 1/4"	PM	3-4Ω	43999	52A1	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		FIRESTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Stick	44067-1				
L2	Osc. Coil	44066-1				
L3	1st IF Trans.	43872				
L4	2nd IF Trans.	43873				
L5	3rd IF Trans.	43960				

BATTERIES

ITEM No.	VOLTAGE	FIRESTONE PART No.	REPLACEMENT DATA								
			BURGESS			EVEREADY			MALLORY		
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	"A"	"B"	"A-B"
M1	1.5V		2R *			950 *			M-13 *		

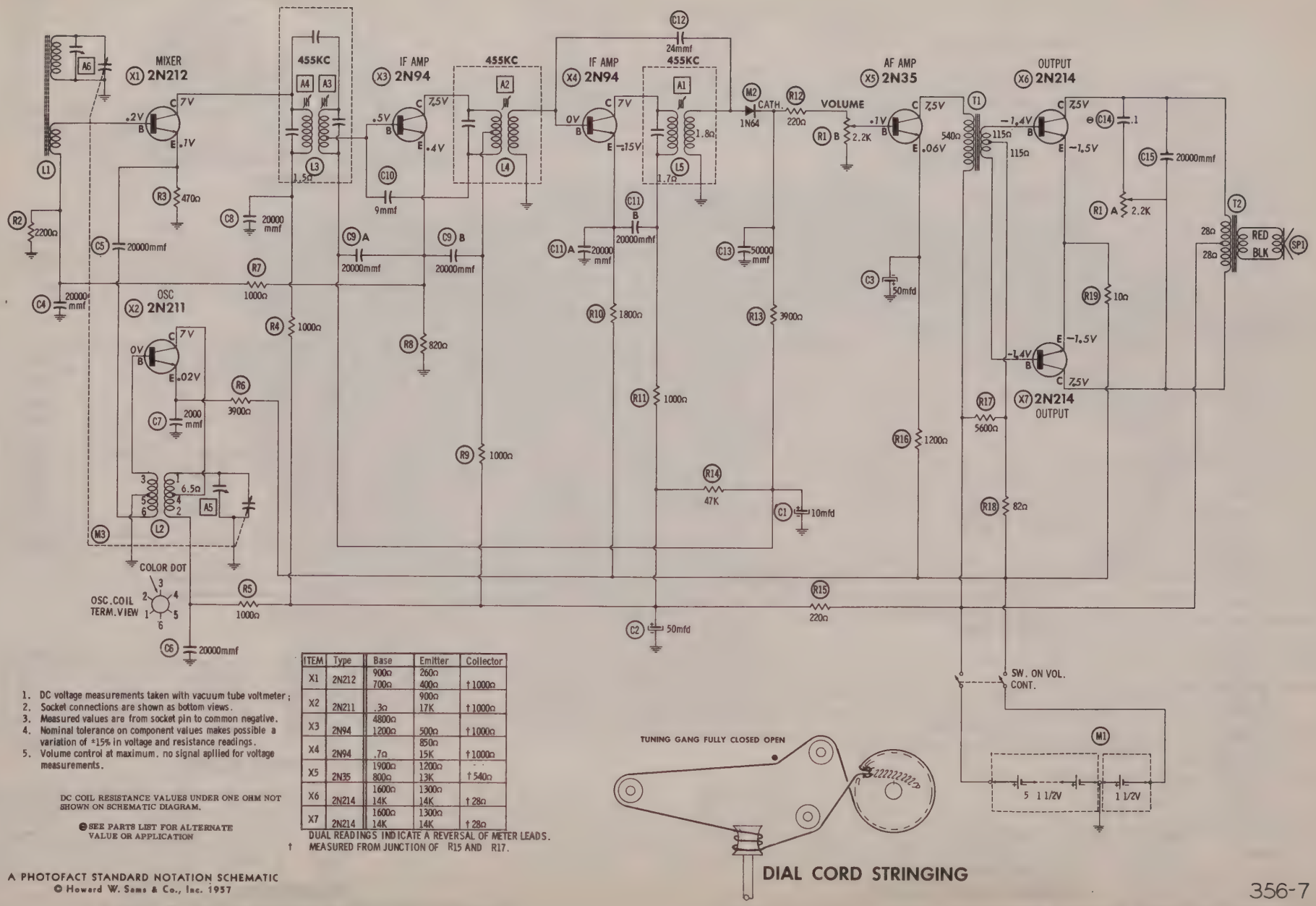
* REQUIRES 6 IN SERIES

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA		NOTES
		FIRESTONE PART No.	SYLVANIA PART No.	
M2	1N64		1N60	Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	FIRESTONE PART No.	NOTES
M3	Tuning Cap.	43989	2 Gang
	Cabinet	44368-98	British Tan. Includes Dial Crystal and Nameplate.
	Dial Crystal	44144	
	Knob	44054-1	Tuning and Tone
	Knob	44055	Dial Change & On-Off-Volume
	Pointer	44114	
	Handle	43696-1	



ITEM	Type	Base	Emitter	Collector
X1	2N212	900Ω 700Ω	260Ω 400Ω	†1000Ω
X2	2N211	.3Ω	900Ω 17K	†1000Ω
X3	2N94	4800Ω 1200Ω	500Ω	†1000Ω
X4	2N94	.7Ω	850Ω 15K	†1000Ω
X5	2N35	1900Ω 800Ω	1200Ω 13K	†540Ω
X6	2N214	1600Ω 14K	1300Ω 14K	†28Ω
X7	2N214	1600Ω 14K	1300Ω 14K	†28Ω

1. DC voltage measurements taken with vacuum tube voltmeter;
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum. no signal apllied for voltage measurements.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DUAL READINGS INDICATE A REVERSAL OF METER LEADS.

† MEASURED FROM JUNCTION OF R15 AND R17.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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PHOTOFACT* Folder

*TRADE MARK

RETMA MEMBER

HOTPOINT MODELS 14S201, -UHF, 14S202, -UHF, 14S203, -UHF ("Q" Line)

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HOTPOINT MODELS 14S201, -UHF, 14S202, -UHF, 14S203, -UHF ("Q" Line)

HOTPOINT MODEL 14S201 ("Q" Line)

TRADE NAME	Hotpoint Models 14S201, 14S202, 14S203 & UHF (Ch. "Q" Line)
MANUFACTURER	Hotpoint Co., 5600 W. Taylor St., Chicago 44, Ill.
TYPE SET	Television Receiver
TUBES	Fourteen
POWER SUPPLY	110-125 Volts AC, 60 Cycles RATING 110 Watts, 1.06 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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PHOTOFACT* Folder
*TRADE MARK

HOTPOINT MODELS 14S201, -UHF, 14S202, -UHF, 14S203, -UHF ("Q" Line)

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DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 6 push-on type control knobs from the side of cabinet.
2. Remove 6 metal screws, 1 hex nut and rear cover.
3. Remove 2 speaker leads, picture tube socket, Ion trap, centering magnet and yoke clamp.
4. Remove 2 speaker bolts and speaker.
5. Remove metal screw holding top of chassis.
6. Remove 2 chassis bolts from bottom.
7. Tilt chassis out from right side, partially remove chassis and yoke, remove HV lead and remove chassis.

CAUTION NOTE

ONE SIDE OF AC LINE CONNECTED TO CHASSIS

Care should be exercised when connecting test equipment or physcially contacting chassis.

MODEL	CHASSIS
14S201	"Q" Line

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF oscillator is possible by removing the channel selector and fine tuning knobs. Set the fine tuning at the center of its range. The adjustments (located in a circle around the shaft) should be made in sequence from the highest to the lowest channel in the area. Channel 13 adjustment is located at 1 o'clock, proceed in a counter clockwise direction adjusting for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

1. Remove 2 metal screws from bottom, holding the front of cabinet.
2. Pull the bottom of the front out and up to remove.
3. Use only pure soap and water to clean safety glass.

FOCUS

The focus may be varied by the position of a strap on the base of the picture tube. The strap can be connected between pins 6 and 29 or 6 and 10. Readjust the Ion trap for the best focus consistent with maximum brightness.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Set the horizontal hold control to the center of rotation. Adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (A7) located on top of chassis.

FUSES

One fuse is used for LV power supply protection. (For location see tube placement chart.)

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

HOTPOINT MODELS 14S201, -UHF, 14S202, -UHF, 14S203, -UHF ("Q" Line)

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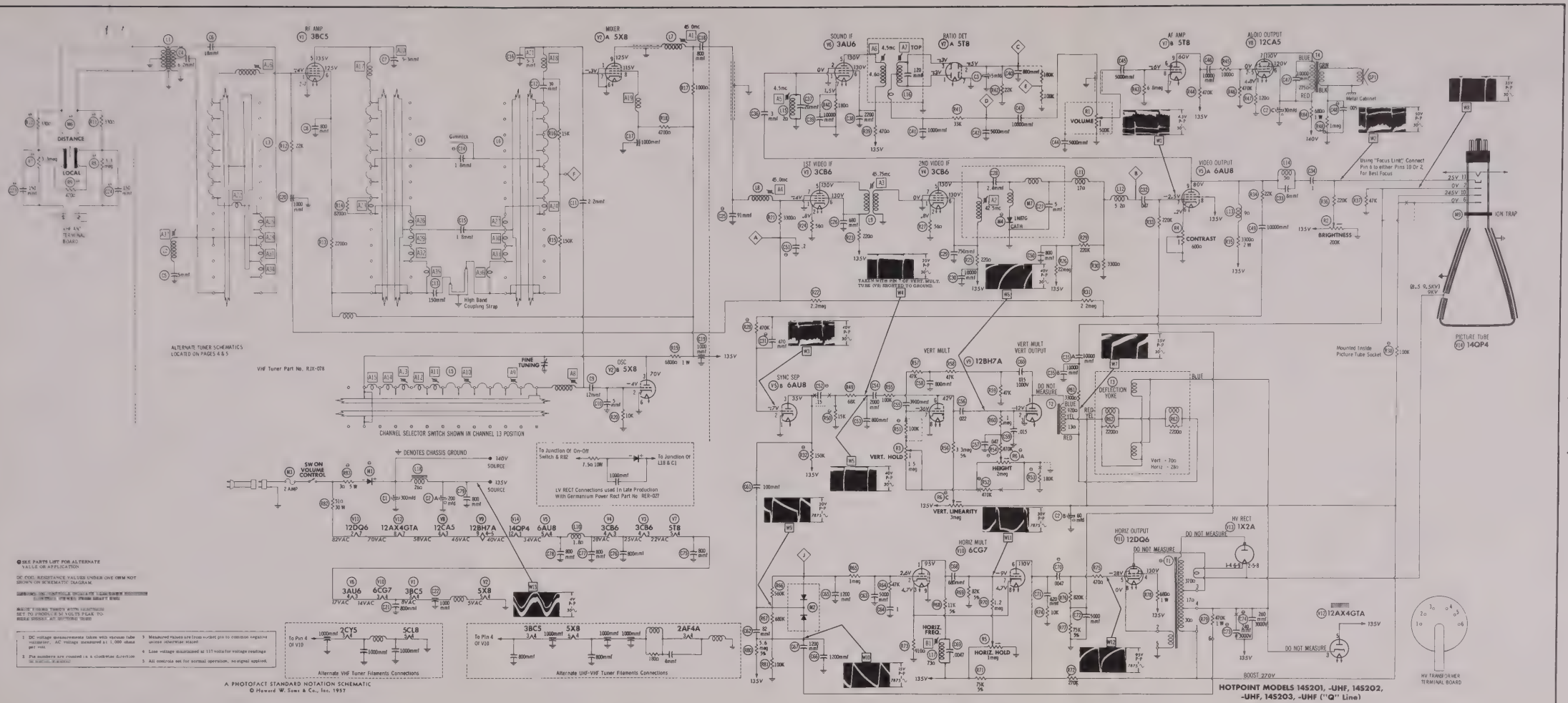

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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HOTPOINT MODELS 14S201, -UHF, 14S202, -UHF, 14S203, -UHF ("Q" Line)

TUBE PLACEMENT CHART

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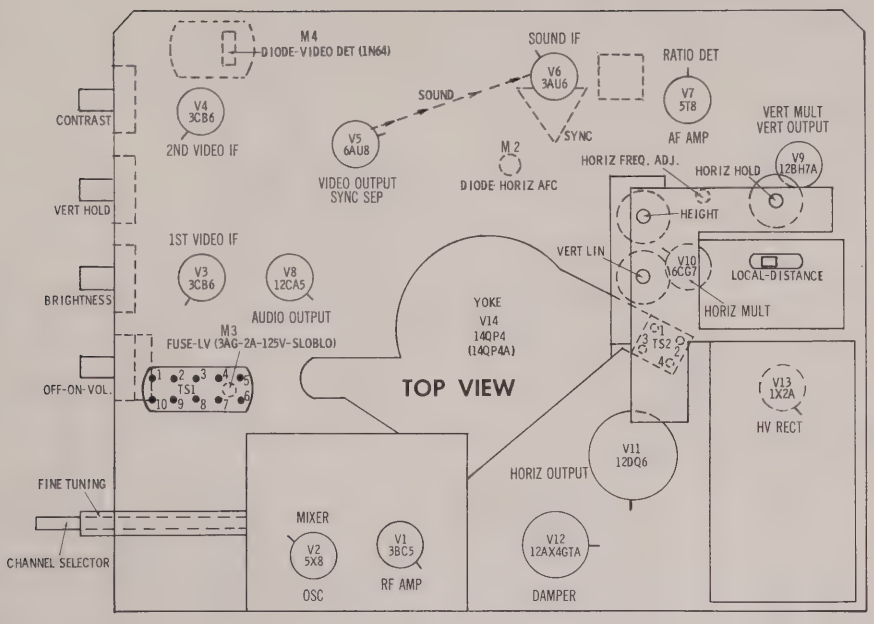


TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

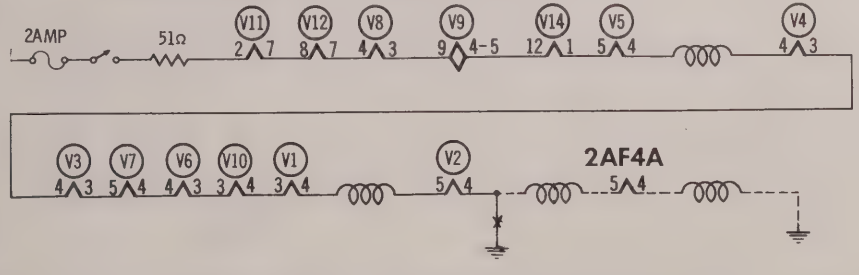
POWER SUPPLY FAILURE
No raster, no sound - **Fuse (M3), Fusible Resistor (R83), Rectifier (M1)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V3, V4, Diode (M4), V5**
No pic, no sound, has snow - **V1, V2**
No pic, has sound, has raster - **V5, V14**
Has pic, no sound - **V6, V7, V8**

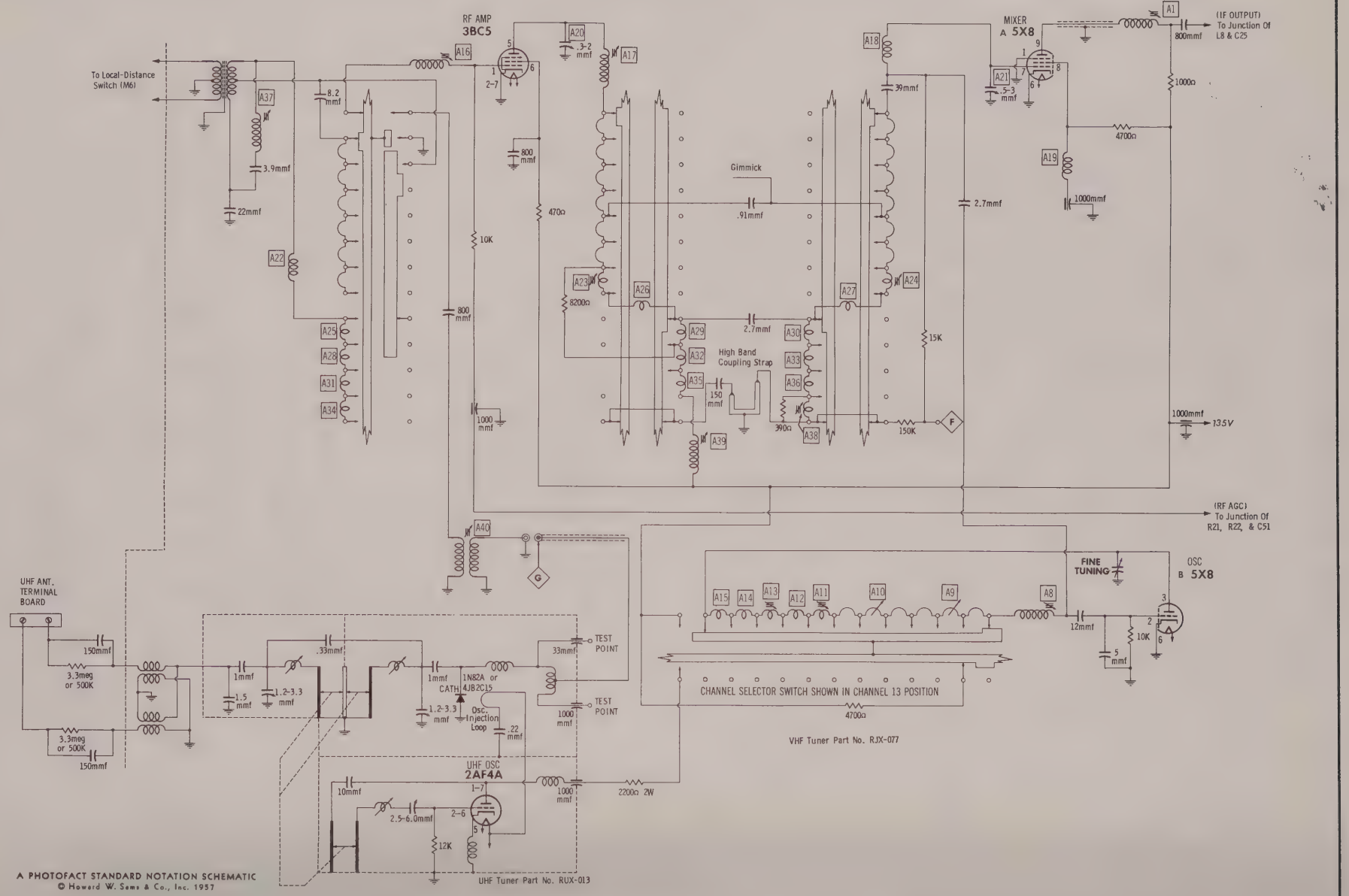
SYNC FAILURE
No vert. sync - **V5**
No horiz. sync - **V5, Diode (M2)**
No vert. or horiz. sync - **V5**

SWEEP FAILURE
No raster, has sound - **M2, V10, V11, V12, V13, V14**
No vertical deflection - **V9**
Poor vert. linearity or foldover - **V9**
Poor horiz. linearity or foldover - **V10, V11, V12**
Narrow picture - **V10, V11, V12, M1**
Vert. off freq. - **V9**
Horiz. off freq. - **V10**

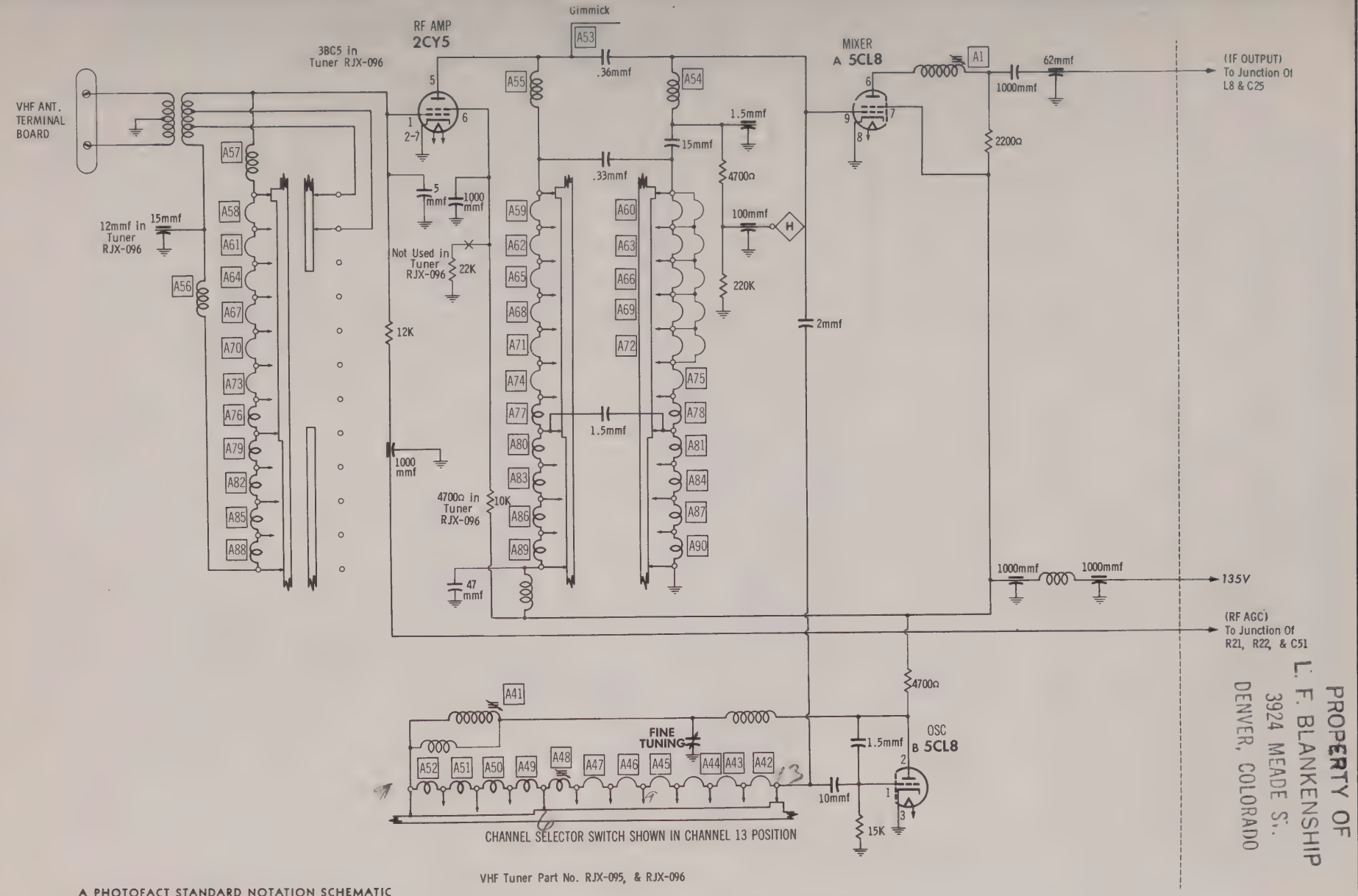
This receiver employs tubes used in a series filament network, an open filament in any tube in the series will cause the set to be inoperative. (See circuit below.)



HOTPOINT MODELS 14S201, -UHF, 14S202, -UHF, 14S203, -UHF ("Q" Line)



ALTERNATE UHF-VHF TUNER SCHEMATIC



ALTERNATE VHF TUNER SCHEMATIC

HOTPOINT MODELS 14S201, -UHF, 14S202, -UHF, 14S203, -UHF ("Q" Line)

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ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS -READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The high voltage shock hazard may be eliminated by connecting the negative lead of a 45 volt bias battery to pin 5 (grid) of the 12DQ6 (V12). Positive to chassis.
Allow 30 minutes warm-up period for receiver and test equipment before proceeding with alignment.

VIDEO IF ALIGNMENT

Turn the volume control fully counter clockwise. Turn the contrast control fully clockwise. Connect the negative lead of a 3 volt battery to point Ⓨ. Positive to chassis. Calibrate the scope so that 3 volts peak to peak produces 2 inches of vertical deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over mixer-osc. tube (V2). Low side to chassis.	Not used.	45.0MC (unmod)	Any unused high VHF channel.	USE VTVM DC probe thru 10K to point Ⓨ. Common to chassis.	A1	Use only enough generator output to provide usable indication on VTVM.
2.	"	"	"	42.5MC			A2	"
3.	"	"	"	45.75MC			A3	"
4.	"	"	"	45.0MC			A4	"
5.	"	"	44MC (30MC Swp)	41.25MC 42.5MC 45.0MC 45.75MC		Vert. amp thru 10K to point Ⓨ. Low side to chassis.		Retouch A1 thru A4 if necessary for response curve similar to Fig. 1 with marker positioned as shown. A2 is used to position 42.5MC marker. Adjust A3 to position 45.75MC marker. Next Al and A4 to shape peak region of curve. The 45.0 marker must be at 3 volt peak to peak calibration.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100K (±1%) resistors in series from point Ⓩ to chassis. The junction of these two resistors is alignment point Ⓧ as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
6.	.01MFD	High side to point Ⓧ. Low side to chassis.	4.5MC (unmod)	Any unused channel.	DC probe to point Ⓧ. Low side to chassis.	A5, A6	Adjust for maximum deflection. Repeat adjustments.
7.	"	"	"	"	DC probe to point Ⓧ. Common to point Ⓩ.	A7	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING TV SIGNAL AND VTVM

Follow steps 6 and 7 using TV signal connected to the antenna instead of AM signal generator.

VHF OSCILLATOR ALIGNMENT FOR TUNERS RJX-075 AND RJX-077

Connect bias as under "Video IF Alignment". Set the fine tuning knob 2/3 turn from maximum counter clockwise position.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Fig. 2	Thru impedance matching network (Fig. 2) across primary of antenna transformer (L1).	213MC (60-15MC Swp)	211.25MC 215.75MC	13	Vert. amp thru 10K to point Ⓨ. Low side to chassis.	A8	Adjust so that marker falls at 45% on response curve as in Fig. 3
9.	"	"	207MC (60-15MC Swp)	205.25MC	12			Check for response curve similar to Fig. 3 with marker at 45%. If necessary, make compromise adjustment of A8 for channels 13 and 12.
10.	"	"	201MC (60-15MC Swp)	199.25MC	11	"	A9	Same as step 8.
11.	"	"	195MC (60-15MC Swp)	193.25MC	10	"		Check for response curve similar to Fig. 3 with marker at 45%. If necessary, make SLIGHT readjustment of A9 to compromise between channels 11, 10 and 9.
			189MC (60-15MC Swp)	187.25MC	9			
12.	"	"	183MC (60-15MC Swp)	181.25MC	8		A10	Same as step 8.
13.	"	"	177MC (60-15MC Swp)	175.25MC	7	"		Check for response curve similar to Fig. 3 with marker at 45%. If necessary, SLIGHTLY retouch A10 to compromise between channels 8 and 7.
14.	"	"	85MC (60-15MC Swp)	83.25MC	6	"	A11	Same as step 8.
15.	"	"	79MC (60-15MC Swp)	77.25MC	5	"	A12	Check for response similar to Fig. 3 with marker at 45%. If necessary, adjust A12 by expanding or compressing coil turns for desired response.
16.	"	"	69MC (60-15MC Swp)	67.25MC	4	"	A13	Same as step 8.
17.	"	"	63MC (60-15MC Swp)	61.25MC	3	"	A14	Check for response similar to Fig. 3 with marker at 45%. If necessary, adjust A14 by expanding or compressing coil turns for desired response.
18.	"	"	57MC (60-15MC Swp)	55.25MC	2	"	A15	Check for response similar to Fig. 3 with marker at 45%. If necessary, adjust A15 by compressing or expanding coil turns for desired response.

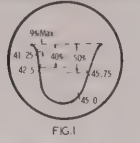


FIG. 1

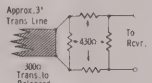
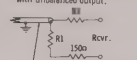


FIG. 2

A



Zo : Impedance of Cable

Zo	R1	R2
50Ω	56Ω	120Ω
75Ω	82Ω	110Ω
90Ω	110Ω	100Ω

Ro - Terminating Impedance

FIG. 2

B

FIG. 3

FIG. 4

FIG. 5

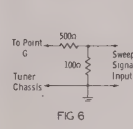


FIG 6

FIG 7

VHF RF AND MIXER ALIGNMENT FOR TUNERS RJX-078 AND RJX-077

Connect the bias as under "Video IF Alignment". When checking response, the tuner shield cover should be in place.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
19.	Fig. 2	Thru matching network (Fig. 2) across primary of antenna transformer (L1).	213MC (60-15MC Swp)	211.25MC 215.75MC	13	Vert. amp thru 10K to point Ⓨ. Low side to chassis.	A18, A17 A18, A19	Adjust or knife A18, A17 and A18 for maximum amplitude and symmetry similar to Fig. 4. Tilt and band width is also adjusted by varying the position of the "Gimmick" wire in relation to C14. If the dip at the peak of the response curve is excessive, knife A19 SLIGHTLY to prevent loss of gain.
20.	"	"	177MC (60-15MC Swp)	175.25MC 179.75MC	7	"	A20, A21	Adjust A20 and A21 for maximum gain and symmetry similar to Fig. 4. If unable to obtain the desired band width or the tilt is excessive, readjust the "Gimmick" wire with respect to C14.
21.	"	"	207MC (60-15MC Swp)	205.25MC 209.75MC	13	"		Check for response similar to Fig. 4 on all channels (7-13). If necessary, make compromise adjustment of A20, A21 and the "Gimmick" neat to C14 for desired response on all high band channels.
			201MC (60-15MC Swp)	199.25MC 203.75MC	11			
			195MC (60-15MC Swp)	193.25MC 197.75MC	10			
			189MC (60-15MC Swp)	187.25MC 191.75MC	9			
			183MC (60-15MC Swp)	181.25MC 185.75MC	8			
22.	"	"	85MC (60-15MC Swp)	83.25MC 87.75MC	6	"	A22, A23, A24	Adjust A22, A23 and A24 for maximum gain of response curve and flatness of top as in Fig. 5. Adjustment is made by knifing the coils.
23.	"	"	79MC (60-15MC Swp)	77.25MC 81.75MC	5	"	A25, A26, A27	Check the tracking. If necessary, adjust by knifing the coils for response as shown in Fig. 5. (Must not be off more than 1/2%).
24.	"	"	69MC (60-15MC Swp)	67.25MC 71.75MC	4	"	A28, A29, A30	"
25.	"	"	63MC (60-15MC Swp)	61.25MC 65.75MC	3	"	A31, A32, A33	"
26.	"	"	57MC (60-15MC Swp)	55.25MC 59.75MC	2	"	A34, A35, A36	"

IF INTERFERENCE TRAP ALIGNMENT

A37 is aligned at the factory for approximately 42.5MC. A37 may be readjusted in the field to eliminate any interference between 40 and 50MC. When adjusting the trap core, care should be exercised as that normal channel 2 response is not affected. Adjust A37 for MINIMUM IF interference pattern on the screen.

40MC CHANNEL ALIGNMENT OF VHF TUNER RJX-077

Connect bias as under "Video IF Alignment". Remove the tuner output link at the end next to the first IF stage. Terminate the open end of the link with a 68 ohm carbon resistor. Set the tuner knob to the UHF position.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
27.	Fig. 6	High side thru network (Fig. 6) to point Ⓨ. Low side to chassis.	630MC (30MC Swp)	40.5MC 45.75MC	Between channels 35 & 36.	Vert. amp thru 10K to point Ⓨ.	A38, A39, A40	Adjust for response curve similar to Fig. 7. Adjust A38 and A39 for maximum amplitude. Adjust A40 for maximum gain and zero tilt. Do not allow coils to touch. Disregard possibility of notch caused by IF trap (A37). Remove resistor and reconnect IF output link.

VHF OSCILLATOR ALIGNMENT FOR TUNERS RJX-095 AND RJX-098

Check the alignment of the IF system before attempting tuner alignment.
Connect bias as under "Video IF Alignment".
Set the fine tuning approximately 10 to 15° from full clockwise position.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
28.	Fig. 2	Across antenna terminals thru dummy antenna (Fig. 2).	213MC (10MC Swp)	211.25MC	13	Vert. amp thru 10K to point Ⓨ. Low side to chassis.	A41	Adjust to place video marker at 49% on high frequency side of curve as in Fig. 3. A42 thru A47 and A49 thru A58 are adjusted by compressing or expanding coil turns.
			207MC (10MC Swp)	205.25MC	12		A42	
			201MC (10MC Swp)	199.25MC	11		A43	
			195MC (10MC Swp)	193.25MC	10		A44	
			189MC (10MC Swp)	187.25MC	9		A45	
			183MC (10MC Swp)	181.25MC	8		A46	
			177MC (10MC Swp)	175.25MC	7		A47	
			85MC (10MC Swp)	83.25MC	6		A48	
			79MC (10MC Swp)	77.25MC	5		A49	
			69MC (10MC Swp)	67.25MC	4		A50	
			63MC (10MC Swp)	61.25MC	3		A51	
			57MC (10MC Swp)	55.25MC	2		A52	

ALIGNMENT INSTRUCTIONS (cont)

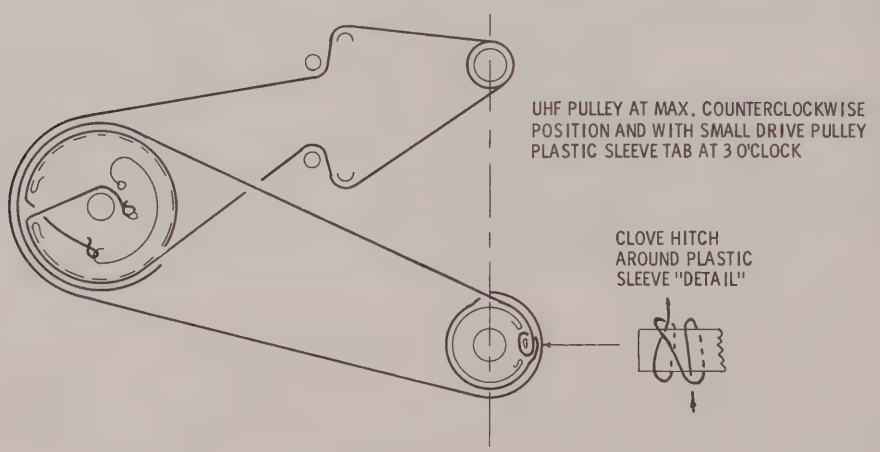
VHF RF AND MIXER ALIGNMENT FOR TUNERS RJX-095 AND RJX-096

Remove the tuner cover and connect the negative lead of a 3 volt bias battery to point (A). Positive to chassis.
Remove link from tuner output, leaving ground lead connected. Connect a 100 ohm carbon resistor between tuner output and ground.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
29.	Fig. 2	Across antenna terminals thru dummy antenna (Fig. 2).	213MC (10MC Swp)	211. 25MC 215. 75MC	13	Vert. amp. thru 10K to point (H). Low side to chassis.	A53, A54, A55, A56, A57	Adjust for response similar to Fig. with markers as indicated. Adjust "Gimmick" (A53) for proper band width. Adjust A54 to correct video side of curve and A55 for sound side. Adjust A56 and A57 for maximum amplitude.
30.	"	"	207MC (10MC Swp)	205. 25MC 209. 75MC	12	"	A58, A59, A60	Adjust A58 for maximum gain and symmetry as in Fig. 5. Adjust A60 to correct video side of curve and A59 for sound side. Adjust by expanding or compressing coil turns.
31.	"	"	201MC (10MC Swp)	199. 25MC 203. 75MC	11	"	A61, A62, A63	Adjust A61 for maximum gain and symmetry as in Fig. 5. Adjust A63 to correct video side of curve and A62 for sound side. Adjust by expanding or compressing coil turns.
32.	"	"	195MC (10MC Swp)	193. 25MC 197. 75MC	10	"	A64, A65, A66	Adjust A64 for maximum gain and symmetry as in Fig. 5. Adjust A66 to correct video side of curve and A65 for sound side. Adjust by expanding or compressing coil turns.
33.	"	"	189MC (10MC Swp)	187. 25MC 191. 75MC	9	"	A67, A68, A69	Adjust A67 for maximum gain and symmetry as in Fig. 5. Adjust A69 to correct video side of curve and A68 for sound side. Adjust by expanding or compressing coil turns.
34.	"	"	183MC (10MC Swp)	181. 25MC 185. 75MC	8	"	A70, A71, A72	Adjust A70 for maximum gain and symmetry as in Fig. 5. Adjust A72 to correct video side of curve and A71 for sound side. Adjust by expanding or compressing coil turns.
35.	"	"	177MC (10MC Swp)	175. 25MC 179. 75MC	7	"	A73, A74, A75	Adjust A73 for maximum gain and symmetry as in Fig. 5. Adjust A75 to correct video side of curve and A74 for sound side. Adjust by expanding or compressing coil turns.
36.	"	"	85MC (10MC Swp)	83. 25MC 87. 75MC	6	"	A76, A77, A78	Adjust A76 for maximum gain and symmetry as in Fig. 5. Adjust A78 to correct video side of curve and A77 for sound side. Adjust by expanding or compressing coil turns.
37.	"	"	79MC (10MC Swp)	77. 25MC 81. 75MC	5	"	A79, A80, A81	Adjust A79 for maximum gain and symmetry as in Fig. 5. Adjust A81 to correct video side of curve and A80 for sound side. Adjust by expanding or compressing coil turns.
38.	"	"	69MC (10MC Swp)	67. 25MC 71. 75MC	4	"	A82, A83, A84	Adjust A82 for maximum gain and symmetry as in Fig. 5. Adjust A84 to correct video side of curve and A83 for sound side. Adjust by expanding or compressing coil turns.
39.	"	"	63MC (10MC Swp)	61. 25MC 65. 75MC	3	"	A85, A86, A87	Adjust A85 for maximum gain and symmetry as in Fig. 5. Adjust A87 to correct video side of curve and A86 for sound side. Adjust by expanding or compressing coil turns.
40.	"	"	57MC (10MC Swp)	55. 25MC 59. 75MC	2	"	A88, A89, A90	Adjust A88 for maximum gain and symmetry as in Fig. 5. Adjust A90 to correct video side of curve and A89 for sound side. Adjust by expanding or compressing coil turns. Remove resistor and reconnect link.

UHF TUNER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.


UHF PULLEY AT MAX. COUNTERCLOCKWISE POSITION AND WITH SMALL DRIVE PULLEY PLASTIC SLEEVE TAB AT 3 O'CLOCK
CLOVE HITCH AROUND PLASTIC SLEEVE "DETAIL"

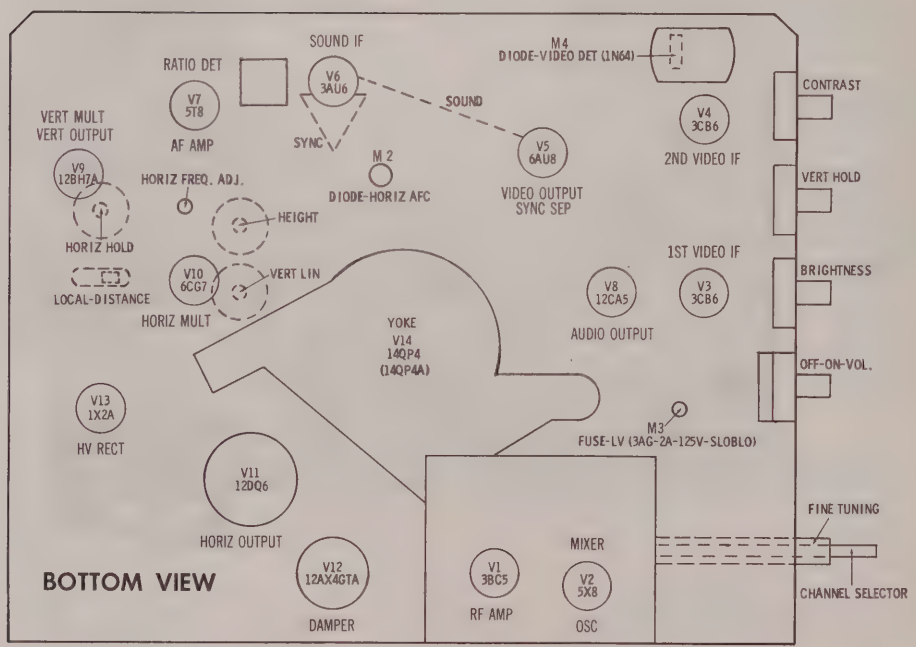
UHF DRIVE CORD STRINGING

CHASSIS TOP VIEW

RESISTANCE MEASUREMENTS

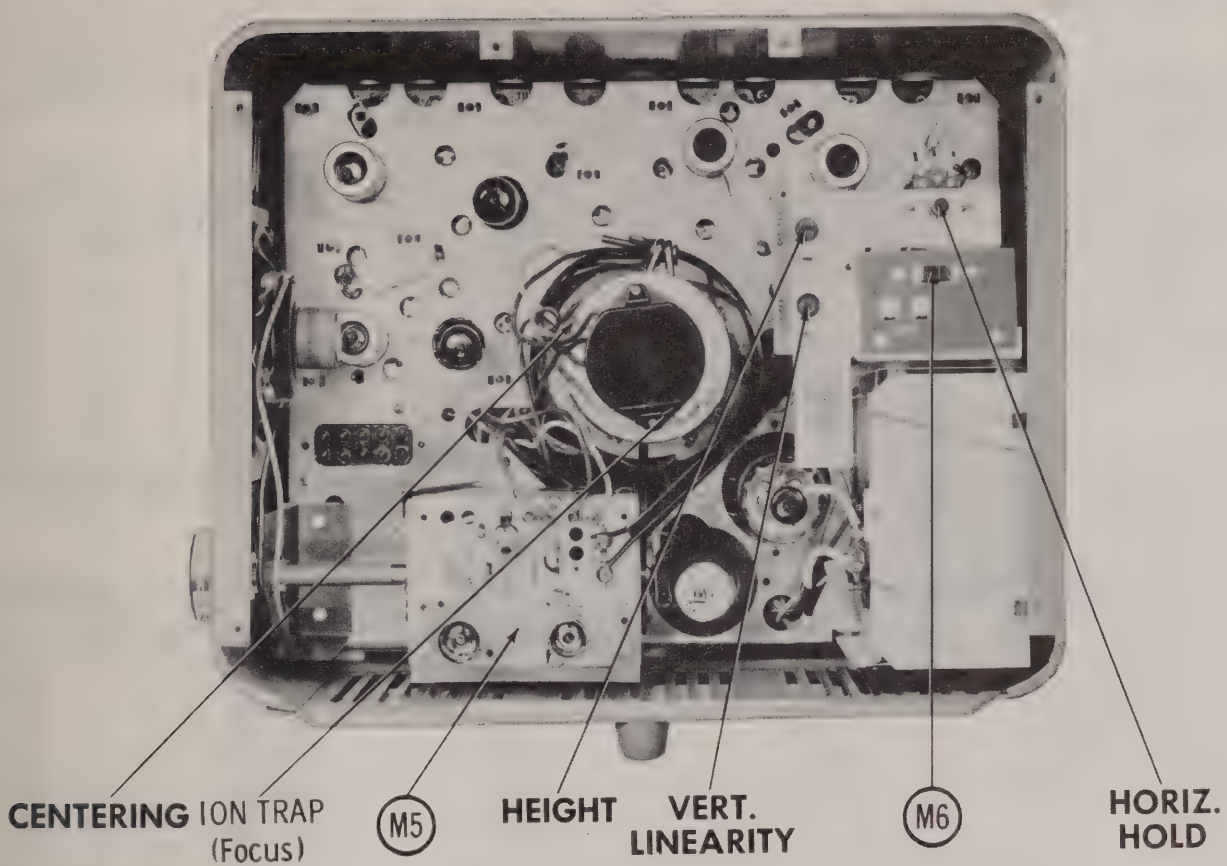
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3BC5	2Meg	0Ω	3Ω	2Ω	† 26Ω	† 2200Ω	0Ω		
V2	5X8	0Ω	10K	† 6800Ω	0Ω	2Ω	0Ω	165K	† 4700Ω	† 1000Ω
V3	3CB6	2Meg	56Ω	5.5Ω	6.5Ω	† 250Ω	† 250Ω	0Ω		
V4	3CB6	.1Ω	56Ω	6.5Ω	7.5Ω	† 250Ω	† 250Ω	0Ω		
V5	6AU8	0Ω	2.4Meg	† 150K	7.5Ω	9Ω	● 8Ω	290K	† 26Ω	† 3300Ω
V6	3AU6	2Ω	0Ω	4Ω	4.5Ω	† 500Ω	† 500Ω	180Ω		
V7	5T8	INF	22K	INF	4.5Ω	5.5Ω	0Ω	0Ω	6.8Meg	† 470K
V8	12CA5	120Ω	470K	11Ω	13Ω	470K	† 680Ω	† 950Ω		
V9	12BH7A	‡ 920Ω	●1.6Meg	0Ω	10Ω	10Ω	● † 4Meg	●1.6Meg	0Ω	11Ω
V10	6CG7	† 11K	1.6Meg	910Ω	3Ω	4Ω	† 75K	● 70K	910Ω	0Ω
V11	12DQ6	NC	16Ω	NC	† 700Ω	900K	TP	14Ω	.8Ω	TOP CAP ‡ 17Ω
V12	12AX4GTA	NC	NC	180K	NC	† 26Ω	NC	13Ω	14Ω	
V13	1X2A	PINS 1 THRU 9 HAVE INFINITE RESISTANCE								TOP CAP ‡ 387Ω
V14	14QP4	9Ω	47K	Pin 6 47K	Pin 10 ‡ 100K	Pin 11 ● 200K	Pin 12 10Ω			

† MEASURED FROM OUTPUT OF M1.
‡ MEASURED FROM PIN 3 OF V12.
● THIS READING WILL VARY, CONTROL SET FOR NORMAL OPERATION.
NC NO CONNECTION
TP TIE POINT



TUBE PLACEMENT CHART

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

1. Turn the set on and tune in a TV station, preferably with a test pattern.
2. Short point (J) to chassis with a clip lead.
3. Connect a 1000 ohm resistor across the horizontal frequency coil (L17).
4. Adjust the horizontal hold control until the picture floats back and forth across the screen.
5. Remove the resistor from across L17 and adjust the horizontal frequency slug (B1) so that the picture again floats back and forth across the screen.
6. Remove the clip lead from point (J) to chassis. Readjust the horizontal hold control if necessary to synchronize the picture horizontally.

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amp.	3BC5	
V2	Mixer-Osc.	3A8	
V3	1st Video IF Amp.	3CB6	
V4	2nd Video IF Amp.	3CB6	
V5	Sync Sep.-Video Output	6AU6	
V6	Sound IF Amp.	3AU6	
V7	Ratio Det.-AF Amp.	3T8	

ITEM No.	USE	TYPE	NOTES
V8	Audio Output	12AV6	
V9	Vert. Mult.-Vert. Output	12BH7A	
V10	Horiz. Mult.	6CG7	
V11	Horiz. Output	12DQ6	
V12	Damper	12AX4GTA	
V13	HV Rectifier	1X2A	

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	HOTPOINT PART No.	CBS	GENERAL ELECTRIC	SYLVANIA PART No.	
V14	14QP4	14QP4	14QP4	14QP4	① Aluminized
	14QP4A	14QP4A ①	14QP4A ②	14QP4A ②	② Silver Screen "85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP	VOLT	HOTPOINT PART No	AEROVOX PART No	CORNELL DUBILIER PART No	MALLORY PART No	PYRAMID PART No	SANGAMO PART No	SPRAGUE PART No
C1	300	150	RCE-218	AFH181-24-75	XA3063	FH119	TM8-27	S-415	TVL-3434
C2A	20	150	RCE-238	AFH3-11-150		FP2745.3			X3264*
B	40	350				TCD3185			
C	30	150							
C3	5	50	RCE-174	PRS50V5	BBR5-50	TC-50	TD5-50	MMT-0505	TVA-1303

* Non catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP	VOLT	HOTPOINT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C4	6.2		RCW-3228		C10V6C					
C5	5		RCW-3148	NPO-5I 5	TCZ-5R7	C10V5C	TCO-5	ZT-586	5TCCB-V5	
C6	16		RCW-3287		TCH-16	C10QJ5U	TCH-16			
C7	5-3		RCT-080		S3S-3		3U5-D	CT365A		
C8	600		RCW-3037	RPD-0008	DD-801	L10T8	ED-0008		5GA-T8	
C9	12		RCW-3229							
C10	5		RCW-3148							M470
C11	2.2		RCW-3117	NPO-5I 2.2	TCZ-2R2	C10V22C	TCO-2.2		5TCCB-V22	M150
C12	39		RCW-3189	SI 39	DD-390	L10Q39	ED-39	UC-5439	5GA-Q39	
C13	150		RCW-3149							M220
C14	1.8		NPO-5I 1.8			C10V15C				Note 1
C15	1.8		NPO-5I 1.8			C10V15C				
C16	5-3		RCT-080		S3S-3		3U5-D	CT365A		
C17	1000		RCW-3117	EF-001	MFT-1000				50IC-DI	
C18	600		RCW-3037	RPD-0008	DD-801	L10T8	ED-0008		5GA-T8	
C19	1000		RCW-3117	EF-001	MFT-1000				50IC-DI	
C20	1000		RCW-3117	EF-001	MFT-1000				50IC-DI	
C21	600		RCW-3037	RPD-0008	DD-801	L10T8	ED-0008		5GA-T8	
C22	1000		RCW-3117	EF-001	MFT-1000				50IC-DI	
C23	150		UCG-038	1469-00015	DD-151	32RS715	ED-150	UC-5215	MS-3I5	Note 2
C24	150		UCG-032	1469-00015	DD-151	32RS715	ED-150	UC-5215	MS-3I5	Note 3
C25	91		RCW-3181	NPO-5I 1	TCM-1		TCD-1			Note 3
C26	680		RCW-3051	RPD-0008	DD-681	HYA1QT68	ED-680	UC-5868	5GA-T68	
C27	5		RCG-012	NPO-5I 5	C10V5C		ED-5	ZT-586	5TCCB-V5	
C28	3.4		RCW-3057	NPO-5I 3.3	TCZ-3R3	C10V33C				
C29	750		RCW-3231							
C30	10000		RCW-3186	RPD-5I	DD-103	HYA6SI	ED-5I	DC5I	5HK-5I	M150
C31	470		RCW-3097					UC-5347	5GA-Q47	Note 4
C32	.047	300		RPD-05	DF-503	CU3BS47		GEM-5347	5TM-S47	
C33	8		RCW-3009							
C34	.1	400		P488N-1	DF-104	CU5AP1		GEM-4Q1	4TM-P1	
C35A	10000		RCH-104	RPD-5X01	DD563-103	HYD6DX5	ED-5I	DC5I	5HK-5I	
B	10000						ED-5I	DC5I		
C36	3		RCW-1066	NPO-5I 3		C10V3C	TCO-3	ZT-553		
C37	20		RCW-3172	NPO-5I 20	TCZ-20	C10QJC	TCO-20	ZT-543	5TCC-Q2	
C38	2300		RCW-3247	RPD-0023	D6-233	HYA1UD23	ED-0023	UC-5232	5GA-D23	
C39	10000		RCW-3186	RPD-5I	DD-103	HYA6SI	ED-5I	DC5I	5HK-5I	
C40	600		RCW-3037	RPD-0008	DD-801	L10T8	ED-0008		5GA-T8	
C41	1000		RCW-3213	RPD-001	DD-103	HYA5DI	ED-1000	DC5I	5HK-DI	
C42	5000		RCW-3214	RPD-005	DD-503	HYA1DD5	ED-005	DC535	5HK-D5	
C43	5000		RCW-3186	RPD-5I	DD-103	HYA6SI	ED-5I	DC5I	5HK-5I	
C44	5000		RCW-3214	RPD-005	DD-502	HYA1DD5	ED-005	DC525	5HK-D5	
C45	5000		RCW-3214	RPD-005	DD-503	HYA1HD5	ED-005	DC535	5HK-D5	
C46	10000		RCW-3186	RPD-5I	DD-103	HYA6SI	ED-5I	DC5I	5HK-5I	
C47	10000		RCW-3186	RPD-5I	DD-103	HYA6SI	ED-5I	DC5I	5HK-5I	
C48	.005	600		RPD-005	DF-502	CU3BD5	ED-005	GEM-535	5TM-D5	Note 5
C49	10000		RCW-3186	RPD-5I	DD-103	HYA6SI	ED-5I	DC5I	5HK-5I	
C50	600		RCW-3037	RPD-0008	DD-801	L10T8	ED-0008		5GA-T8	
C51	.2	200		P288N-2		CU3EP2		GEM-203	2TM-P2	Note 6
C52	.15	400		P488M-15		CU5AP15		GEM-4015	4TM-P15	Note 7
C53	600		RCW-3184	RPD-0008	DD-811	L10T8	ED-0008		5GA-T8	
C54	2300		RCW-3225	RPD-023	DD-203	HYA1DD2	ED-0023	DC523	5HK-D23	
C55	3900		RCW-3185	RPD-004	D4-403	HYA1QD4	ED-004	UC-5240	5GA-D39	
C56	.022	600		RPD-02	DF-303	CU3BS22	ED-02	GEM-5122	5TM-S23	
C57	.047	200		RPD-05	DF-503	CU3BS47		GEM-2147	2TM-S47	
C58	600		RCW-3184	RPD-0008	DD-801	L10T8	ED-0008		5GA-T8	
C59	.015	600		RPD-015	DF-153	CU3BS15	ED-015	GEM-5115	5TM-S15	
C60	.015	1000		P108M-015		CU5BS15	ED-015	GEM-10115	10TM-S15	
C61	100		RCW-3181	SI 100	D6-101	L10T1	ED-100	UC-531	5GA-T1	
C62	82		RCW-3183	SI 82	D6-850	L10Q82	ED-82		5GA-Q82	
C63	5000		RCW-3188	RPD-005	DD-502	HYA1DD5	ED-005	DC535	5HK-D5	
C64	.1	200		P288N-1	DF-104	CU3EP1		GEM-201	2TM-P1	
C65	1200		RCW-3187	RPD-001	D6-132	L10D12	ED-0012	UC-5212	5GA-D12	
C66	1200		RCW-3187	RPD-001	D6-123	L10D12	ED-0012	UC-5213	5GA-D12	
C67	1200		RCW-3187	RPD-001	D6-132	L10D12	ED-0012	UC-5212	5GA-D12	
C68	680		RCW-3273	1467-00068	D6-681	5RS768	ED-680	UC-5268	MS-368	
C69	.0047	600		RPD-0047	DD-472	CU3BD47	ED-0047	GEM-5347	5TM-D47	
C70	.0047	600		RPD-0047	DD-472	CU3BD47	ED-0047	GEM-5347	5TM-D47	Note 8
C71	620		RCW-3280	1464-00052		5RS762			MS-362	
C72	5000		RCW-3214	RPD-005	DD-502	HYA1DD5	ED-005	DC535	5HK-D5	
C73	240	3000	RCW-3259							Note 7
C74	240	3000	RCW-3258							Note 9
C75	600		RCW-3037	RPD-0008	DD-801	L10T8	ED-0008		5GA-T8	
C76	600		RCW-3037	RPD-0008	DD-801	L10T8	ED-0008		5GA-T8	
C77	600		RCW-3037	RPD-0008	DD-801	L10T8	ED-0008		5GA-T8	

PARTS LIST AND DESCRIPTIONS

CAPACITORS (cont)

ITEM No.	RATING		HOTPOINT PART No	AEROVOX PART No	CENTRALAB PART No	REPLACEMENT DATA CORNELL DUBILIER PART No	ERIE PART No	MALLORY PART No	SPRAGUE PART No	NOTES
	CAP	VOLT								
C78	600		RCW-3037	RPD-0008	DD-801	L10T8	ED-0008		5GA-T8	
C79	600		RCW-3037	RPD-0008	DD-801	L10T8	ED-0008		5GA-T8	

Note 1: Some versions use a 82MMF in this application.
Note 2: In some versions this part is combined with a 500K resistor as component combination part #RCR-002.
Note 3: In some versions this cap.has been replaced by an 82MMF feed thru in tuners RJX-077 & RJX-078 and in some RJX-066 -066 it is a 62MMF feed thru.
Note 4: In some versions C3B and resistor R38 are component combination part #RCR-003.
Note 5: In some versions C48 becomes 4700MMF and is combined with resistor R48 as component combination part #RCR-001.
Note 6: Some versions use a .1MFD in this application.
Note 7: Not used in some versions.
Note 8: Some versions use a 5000MMF in this application.
Note 9: Some versions use a 500MMF @ 3000 V (Part #RCW-3318) in this application.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESIST ANCE	WATTS	HOTPOINT PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½	RRC-388	AB-50	A47-500K-2	QJ3-133	U48	Volume
B	Shaft			AK-2	KS6-3	Not Req.	Not Req.	
C	Switch			KB-1	SWE-12	78-1	U8-26	
R2A	250K	½	RRC-389	AB-48	A47-250K-S	QJ1-129	U43	Brightness
B	Shaft			AK-2	KS6-3	Not Req.	Not Req.	
R3A	1.5Meg	½	RRC-387	AB-743	A47-1.5Meg-S	QJ1-158	TA1SSJ	Vert. Hold
B	Shaft			AK-2	KS6-3	Not Req.	Not Req.	
R4A	500K	½	RRC-388	AB-5	A47-750-S	QJ1-103	TA7SLL	Contrast
B	Shaft			AK-2	KS6-3	Not Req.	Not Req.	
R5A	1Meg	½	RRC-395	AB-89	A47-1Meg-S	QJ1-137		Horiz. Hold
B	Shaft			AK-10	KS6-3	TQ		
R8A	2Meg	½	RRC-311	AB-75	A47-2Meg-S	QJ1-139	PTA58L	Height - Note 1
B	Shaft			AK-10	KS6-3	TQ	Not Req.	
C	3Meg	½	RRC-301	AB-84	A47-3Meg-S	QJ1-140	SU-19	Vertical Lin. -Note 1
D	Shaft			AK-10	KS6-3	TQ	Not Req.	

Note 1: In chassis stamped (HQ) Height Control (R8A) is changed to a 850K ½ W control with a 150K stop and is combined with R8C (Vertical Lin.) to become part #RRC-421.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA HOTPOINT PART No.	NOTES
	OHMS	WATT		
R7	3.3Meg		BTS-3.3Meg	Note 1
R8	3.3Meg		BTS-3.3Meg	Note 1
R9	470Ω		BTS-470	Note 2
R10	330Ω		BTS-330	Note 2
R11	330Ω		BTS-330	Note 2
R12	22K		BTS-22K	
R13	22000Ω		BTS-22000	
R14	4700Ω		BTS-4700	
R15	150K		BTS-150K	
R16	15K		BTS-15K	
R17	1000Ω		BTS-1000	
R18	4700Ω		BTS-4700	
R19	68000Ω	1	BTA-6900	
R20	10K		BTS-10K	
R21	3300Ω		BTS-3300	
R22	2.2Meg		BTS-2.2Meg	
R23	2200Ω		BTS-220	
R24	560Ω		BTS-56	
R25	2200Ω		BTS-220	
R26	22Meg		BTS-22Meg	
R27	560Ω	RRD-004	BTS-56	
R28	470K		BTS-470K	Note 3
R29	220K		BTS-220K	
R30	33000Ω		BTS-3300	
R31	2.2Meg		BTS-2.2Meg	
R32	150K		BTS-150K	Note 5
R33	220K		BTS-220K	
R34	22K		BTS-22K	
R35	3300Ω	2	BTS-3300	
R36	220K		BTS-220K	
R37	47K		BTS-47K	
R39	100K		BTS-100K	Note 9
R39	4700		BTS-470	
R40	180Ω		BTS-180	
R41	33K		BTS-33K	
R42	22K		BTS-22K	
R43	6.8Meg		BTS-6.8Meg	
R44	470K		BTS-470K	
R45	1000Ω		BTS-1000	
R46	470K		BTS-470K	

ITEM No.	RATING		REPLACEMENT DATA HOTPOINT PART No.	NOTES
	OHMS	WATT		
R47	120Ω		BTS-120	
R48	1Meg		BTS-1Meg	Note 4
R49	68K		BTS-68K	
R50	15K		BTS-15K	Note 5
R51	100K		BTS-100K	Note 6
R52	470K		BTS-470K	Note 7
R53	180K		BTS-180K	Note 7
R54	470K		BTS-470K	Note 8
R55	100K		BTS-100K	
R56	3.3Meg		BTS-3.3Meg	
R57	47K	5%	BTS-47K	
R58	47K		BTS-47K	
R59	47K		BTS-47K	
R60	1Meg		BTS-1Meg	
R61	3300Ω		BTS-3300	
R62	2200Ω		BTS-220	
R63	2200Ω		BTS-220	
R64	47K		BTS-47K	
R65	1Meg		BTS-1Meg	
R66	10K		BTS-10K	
R67	680K		BTS-680K	
R68	10K	5%	BTS-10K	
R69	82K	5%	BTS-82K	
R70	1.2Meg		BTS-1.2Meg	
R71	75K	5%	BTS-75K	
R72	270K		BTS-270K	
R73	91Ω		BTS-91	
R74	10K		BTS-10K	
R75	470Ω		BTS-470	
R76	820K		BTS-820K	
R77	75K	5%	BTS-75K	
R78	680Ω		BTS-680	
R79	470K	1	BTS-470K	
R80	6.8Meg	5%	BTS-6.8Meg	
R81	100K		BTS-100K	
R82	3Ω	5	RRW-137	PW7-3
R83	3Ω	5		RA-890
R84	680Ω			

Note 1: In some versions this value becomes 500K and is combined with a 150MMF capacitor as component combination part #RCR-002.
Note 2: Not used in some versions.
Note 3: In some versions R28 and capacitor C31 are a component combination part #RCR-005.
Note 4: In some versions R48 and capacitor C48 are a component combination part #RCR-001.
Note 5: A 47K is used in this application in chassis stamped 3Q.
Note 6: A 220K is used in some versions and late production omits the resistor.
Note 7: Not used in chassis stamped 3Q.
Note 8: A 1Meg is used in this application in chassis stamped 3Q.
Note 9: Located inside picture tube socket.
Note 10: Some versions use a germanium rectifier and this part becomes a 7.5Ω 10 W part #RRW-149.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA HOTPOINT PART No.	Halldorson PART No	Merit PART No	RCA TYPE No.	Ram PART No	Stancor PART No.	Thordarson PART No	Triad PART No.
T1	Horiz. Output Trans.	RTO-187-6 RTO-187 ①							
T2	Vert. Output Trans.	RTO-180	21804	A-3037	22271		A-5133	28H53	A-102X
T3A	Yoke(70°)(Horiz.)(L&M)	RLD-073						Y-33	
B	Vert(90M)								

① Alternate part number.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA HOTPOINT PART No	Halldorson PART No	Merit PART No.	Stancor PART No.	Thordarson PART No	Triad PART No.	NOTES
	PRI	SEC							
T4	3700Ω	3-4Ω	RTO-178	Z1105 ① ②	A-2898		23S46 ①	S-18X ① ②	① Drill one new mtg. hole. ② Tape bum reducing tap.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA HOT POINT PART No	QUAM PART No	NOTES
	SIZE	FIELD	V. C. IMP			
SP1	4"	PM	3-4Ω	ROP-035	4A07	

COILS (RF-IF)

ITEM No.	USE	HOTPOINT PART No.	NOTES
L1	Ant. Trans.	RLA-048	
L2	IF Trap	RLI-347	
L3	Ant. Coils	RSE-087	Includes wafer with coils & cap. Includes wafer with coils & resis.
L4	RF Coils	RSE-086	

ITEM No.	USE	HOTPOINT PART No.	NOTES
L5	Osc. Coils	RSE-084	Includes wafer with coils.
L6	Mixer Grid Coils	RSE-085	Includes wafer with coils.
L7	Conv. Plate Coil	RLI-351	

ITEM No.	USE	REPLACEMENT DATA HOTPOINT PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L8	1st Video IF	RLI-361				
L9	2nd Video IF	RTL-184				
L10	FIL Choke	RLI-085	19-1008		4606	2.2 Microhenries; IRC part #C1A
L11	Series Peaking Coil	RLI-340	19-1004		4605	5.6 Microhenries; IRC part #C1A
L12	Series Peaking Coil	RLI-317	19-3300	TV-1R	6112	100 Microhenries
L13	Shunt Peaking Coil	RLI-194	19-3302	TV-1SO	6125	330 Microhenries
L14	Series Peaking Coil	RLI-305	19-3138		6178	180 Microhenries
L15	1st Sound IF	RLI-179				
L16	Ratio Det.	RTD-084				Includes 180MMF cap.; Tertiary winding = .5Ω

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA HOTPOINT PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA PART No.	Ram PART No.	Thordarson PART No.	NOTES
	PRI.	SEC.					TYPE No.			
L17	78Ω		RLI-380							

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA HOTPOINT PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thorlarson PART No.	Triad PART No.
	TOTAL DIRECT CURRENT	D.C. RESISTANCE	INDUCTANCE @ CURRENT (000 ℄)						
L18	.200A	26Ω	.9HY	RLF-074	C5040	C-2864	C-3337	26C41	C-21X ①

① Drill one new mounting hole.

RECTIFIERS

ITEM No.	RATING		REPLACEMENT DATA HOTPOINT PART No.	FEDERAL PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.
	CURRENT (Measured)								
M1	.300A		RER-015 ① ②	1023A ①	1N1007 ③	R3500L1 ①	6S300 ①	6QA3 ①	S30A ①
M2			RER-023 ①	1215 ① ③		121 ① ③			

① Selenium type.
② Used in early production versions; in late production versions a germanium type rectifier, part #RER-037 is used.
③ Germanium type.
② 2 required.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA HOTPOINT PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M3	3AG 6/8 F/T	2A 250V	RSF-021		312002 (3AG-2A-8/8-F/T)		MDV 2	

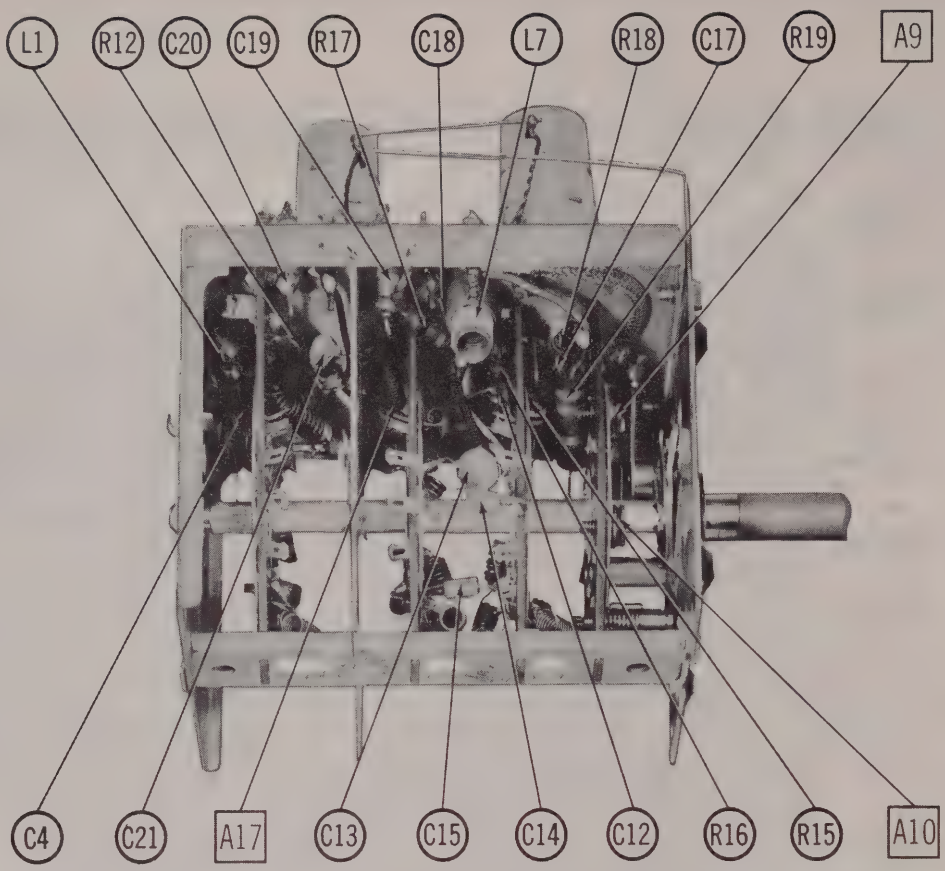
CRYSTAL DIODES

ITEM No.	OSC. TYPE	REPLACEMENT DATA HOTPOINT PART No.	SYLVANIA PART No.	NOTES
M4	1N87GP	RED-001	1N60	Video Detector (Pigtail)

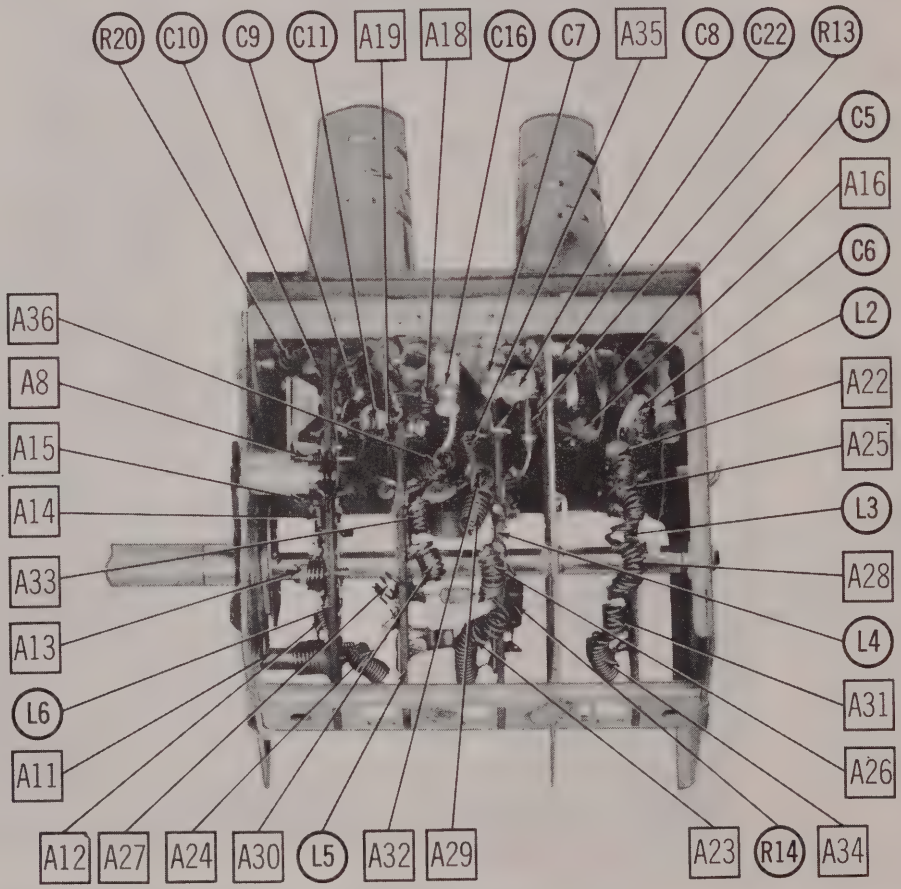
* A 1N64 may be used in some versions.

MISCELLANEOUS

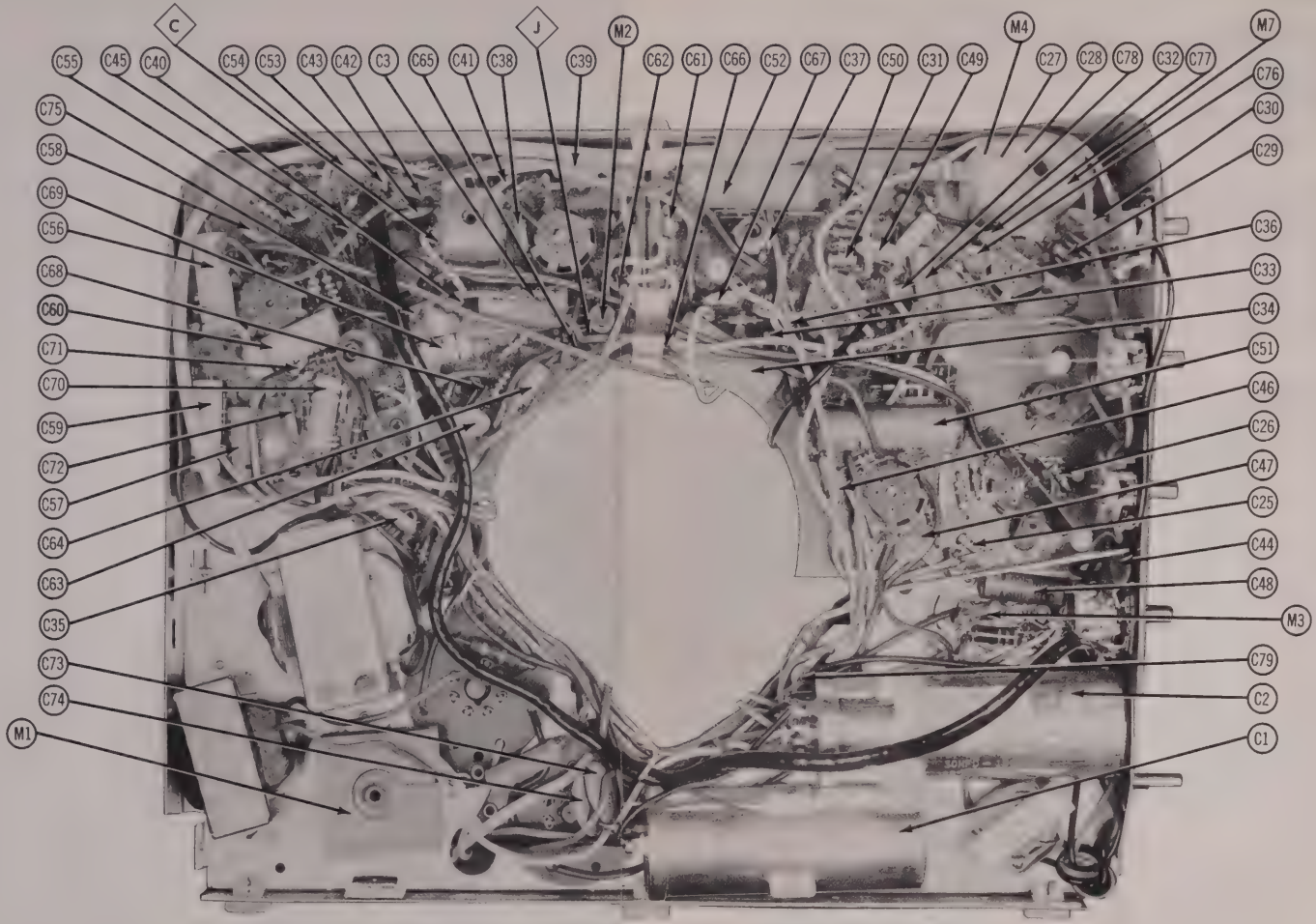
ITEM No.	PART NAME	HOTPOINT PART No.	NOTES
M5	Tuner	RJX-078	VHF, 12 Position.
	Tuner	RJX-077	VHF, 13 Position. Used in UHF-VHF Models.
	Tuner	RJX-083	UHF
	Tuner	RJX-085	VHF
	Tuner	RJX-086	VHF
M6	Switch	RSS-011	Local-Distant, Slide Type (DPDT) Not used in some versions.
M7	Video Det. Ass'y.	RLI-378	3rd Video IF, Includes C37, C38 and M4.
M8	Centering Device	REA-005	
M9	Ion Trap	RET-012	
	Yoke Clamp	RMC-068	Two Required
	Retaining Ring	RRH-013	Yoke
	Safety Glass	RDW-115	Model 14S01.
	Safety Glass	RDW-116	Models 14S03, 14S05.
	Handle	RHY-001	
	Knob	HDK-001	Control, 4 used.
	Knob	HDK-003	Channel Selector
	Knob	HDK-130	Fine Tuning
	Knob	HDK-004	UHF Tuning



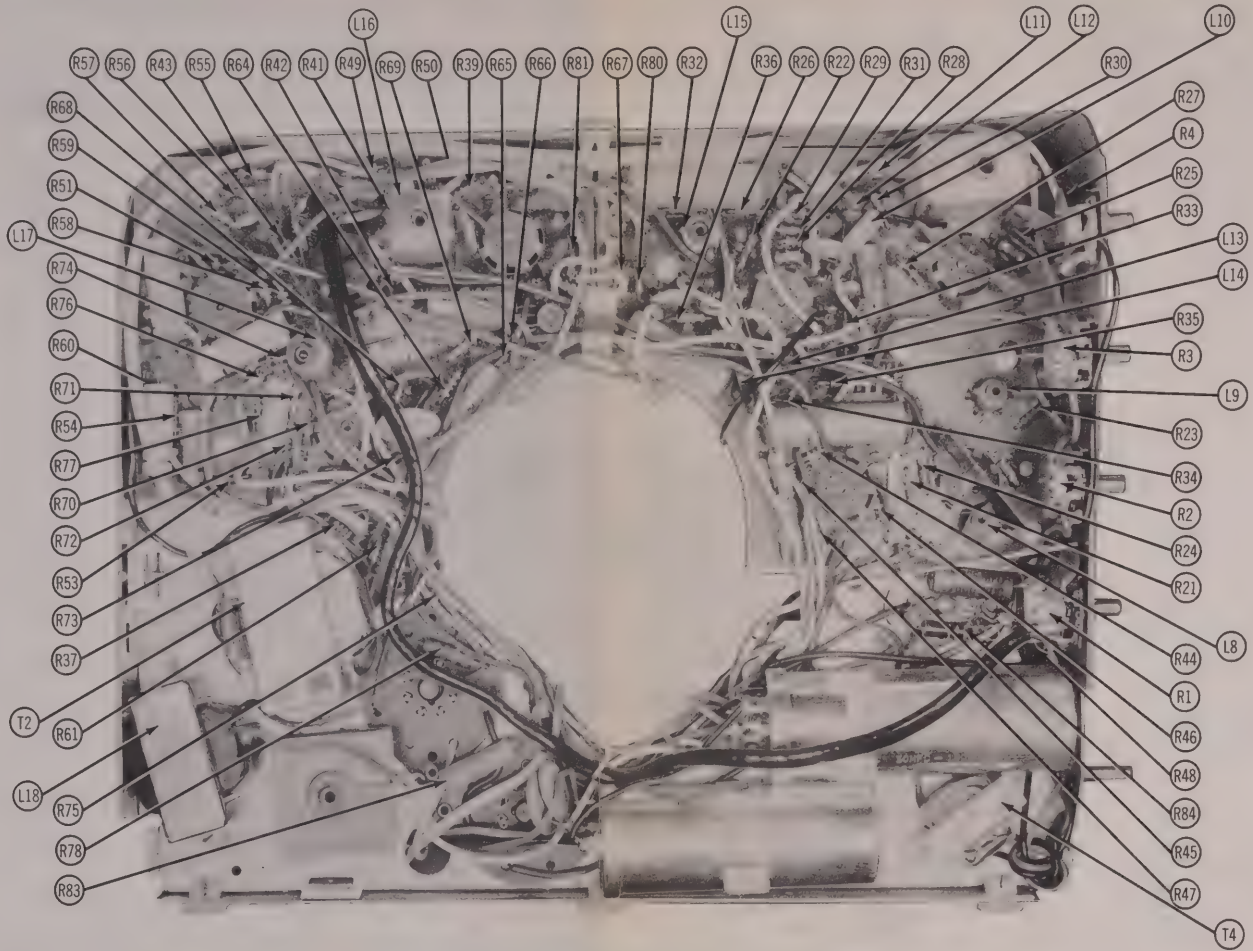
RF TUNER-LEFT SIDE



RF TUNER-RIGHT SIDE



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

KNIGHT
MODEL 93SZ645

KNIGHT
MODEL 93SZ645

TRADE NAME	Knight Model 93SZ645		
SUPPLIER	Allied Radio Corp., 100 N. Western Ave., Chicago 80, Ill.		
TYPE SET	AC (or) Battery Operated 4 Channel 25 Watt Mobile Audio Amplifier		
TUBES (Seven)	Types 12AX7 Mic. 1-Mic, 2-Mag. Preamp., 12AX7 Mic. 1-Mic. 2-Mag. Preamp. 12AX7 AF Amp. -Phase Inv., (2) 6L6G Output, (2) 6X5GT Rectifier		
POWER SUPPLY	110-130 Volts AC - 60 Cycles (or) 6 Volt Storage Battery (or) 12 Volt Storage Battery	RATING	.92 Amp. @ 117 Volts AC (100 Watts) (or) 15.5 Amp. @ 6.3 Volts DC (or) 8.75 Amp. @ 12.6 Volts DC

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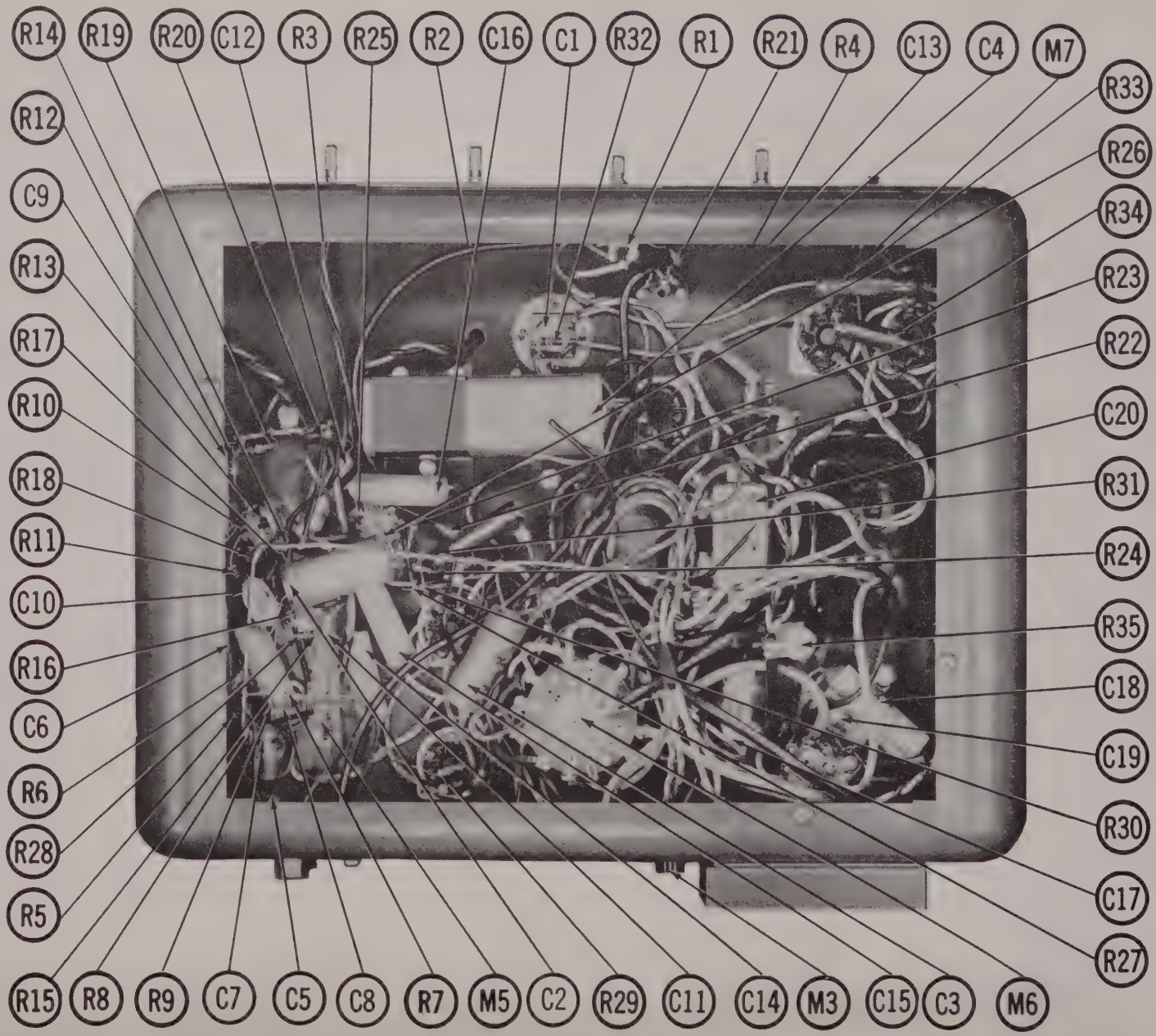


CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Mic. 1-Mic. 2-Mag. Preamp.	12AX7	
V2	Mic. 1-Mic. 2-Mag. Preamp.	12AX7	
V3	AF Amp. -Phase Inverter	12AX7	
V4	Output	6L6G	

ITEM No.	USE	TYPE	NOTES
V5	Output	6L6G	
V6	Rectifier	6X5GT	
V7	Rectifier	6X5GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	KNIGHT PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲40	450		AFH3-41	CO320	FP396. 2	TMT-36	Q-055	TVL-3783
B	■10	450							
C	▲10	450							
C2	8	450		PRS450V8	BR845	TC71	TD-8-450	FM-4508	TVA-1704
C3	35	50		PRS150V40	BR505	TC39	TD-50-50	FM-0550	TVA-1308
C4	4. 0	600		JP09MR600V4	TJU6040	TX803	PLM6-4	7106-4	CR46

FIXED CAPACITORS

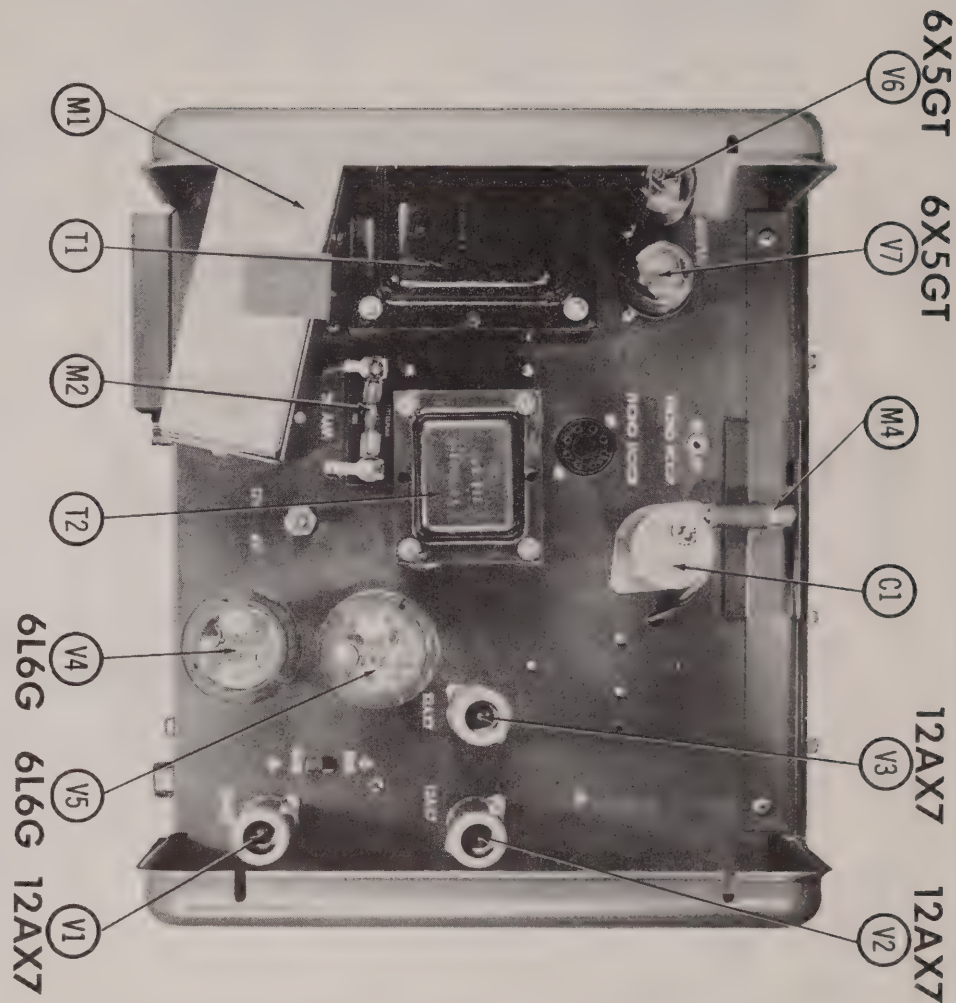
Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	KNIGHT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	. 022	200		BPD-02	DD-203	CUB4S22	ED-02	GEM-4122	4TM-S22	
C6	. 1	600		P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1	
C7	. 022	200		BPD-02	DD-203	CUB4S22	ED-02	GEM-4122	4TM-S22	
C8	. 1	600		P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1	
C9	. 047	600		BPD-05	DF-503	CUB6S47		GEM-6147	6TM-S47	
C10	4700			BPD-0047	DD-472	K079	ED-0047	UC-5247	5HK-D47	
C11	1500			BPD-0015	DD-152	K071	ED-0015	UC-5215	5GA-D15	
C12	. 047	600		BPD-05	DF-503	CUB6S47		GEM-6147	6TM-S47	
C13	. 047	600		BPD-05	DF-503	CUB6S47		GEM-6147	6TM-S47	
C14	. 047	600		BPD-05	DF-503	CUB6S47		GEM-6147	6TM-S47	
C15	. 047	600		BPD-05	DF-503	CUB6S47		GEM-6147	6TM-S47	
C16	. 047	600		BPD-05	DF-503	CUB6S47		GEM-6147	6TM-S47	
C17	. 47	200		P288N-47		CUB2P47		GEM-4047	2TM-P47	
C18	. 47	200		P288N-47		CUB2P47		GEM-4047	2TM-P47	
C19	. 47	200		P288N-47		CUB2P47		GEM-4047	2TM-P47	
C20	. 5	400								

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESIST-ANCE	WATTS	KNIGHT PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½		AB-59	A47-500K-S	Q11-133	U50	Phono Volume
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	
C	Switch			KB-1	SWE-12	76-1	US-26	
R2A	500K	½		AB-60	A47-500K-Z	Q13-133	U48	Mic. 2-Mag. Volume
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	
R3A	500K	½		AB-60	A47-500K-Z	Q13-133	U48	Mic. 1 Volume
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	
R4A	500K	½		AB-60	A47-500K-Z	Q13-133	U48	Tone
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	KNIGHT PART No.	IRC PART No.	
R5	10Meg			BTS-10Meg	
R6	220K			BTS-220K	
R7	47K			BTS-47K	
R8	10Meg			BTS-10Meg	
R9	220K			BTS-220K	
R10	220K			BTS-220K	
R11	47K			BTS-47K	
R12	150K			BTS-150K	
R13	1000Ω			BTS-1000	
R14	220K			BTS-220K	
R15	62K 5%			BTS-62K 5%	
R16	150K			BTS-150K	
R17	47K			BTS-47K	
R18	1000Ω			BTS-1000	
R19	100K			BTS-100K	
R20	100K			BTS-100K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	KNIGHT PART No.	IRC PART No.	
R21	33K			BTS-33K	
R22	470K			BTS-470K	
R23	3000Ω 5%			BTS-3000 5%	
R24	47K			BTS-47K	
R25	680Ω			BTS-680	
R26	47K			BTS-47K	
R27	100K			BTS-100K	
R28	10K			BTS-10K	
R29	470K			BTS-470K	
R30	470K			BTS-470K	
R31	200Ω	10		PW10-200	
R32	10K			BTS-10K	
R33	7500Ω	10		PW10-7500	
R34	10Ω	10		PW10-10	
R35	.2Ω	20			

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	KNIGHT PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
	AC OPERATION									
T1	130VAC Tap ② 117VAC ② .92A	660VCT ② .120A	6.3VCT ① ② 1.5A 6.3VCT ② 2.2A ②	6.3VCT ① ② 1.5A 6.3VCT ② 2.2A ②	LP-0239A					
	DC OPERATION									
	PRI. 1	660VCT ② .120A								
	6.3VCT ② 2.5A ③ 6.3VCT ② 3A ④									
	PRI. 2									
	6.3VCT ② 2.5A ③ 6.3VCT ② 3A ④									

① 6V filament operation.
② 12V filament operation.
③ 6V input operation.
④ 12V input operation.

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	KNIGHT PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	8KCT	500Ω Tap ② 250Ω, 167Ω (70V), 16Ω, 8Ω 4Ω	LO-0093-D						

VIBRATOR

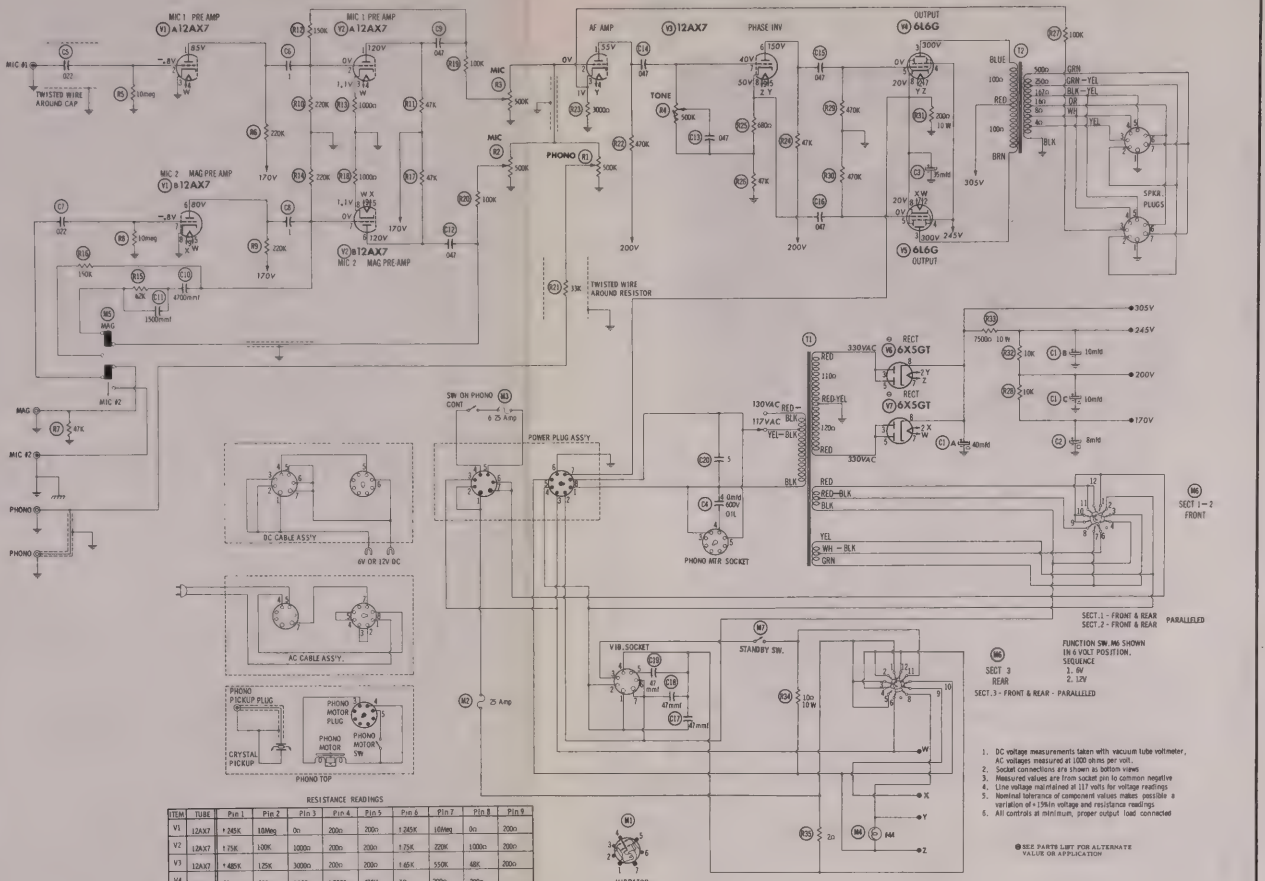
ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				KNIGHT PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interrupter	6 or 12	60~	JV-0021	6VB6UL		6VB6UL	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			KNIGHT PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	411 4AG	25A 32V			411025. (4AG 25A)	456001	MDM 25	4512
M3	313 3AG	6 1/4A 32V			3136.25 (3AG 6 1/4A)	341001	MDL 6 1/4	HKP

MISCELLANEOUS

ITEM No.	PART NAME	KNIGHT PART No.	NOTES
M4	Pilot Light		#44
M5	Switch		Mag-Mic. 2, Slide Type (DPDT)
M6	Switch		Power Changeover (Rotary, Wafer Type) 3 Gang.
M7	Switch		DC On-Stand By, Slide Type (SPST)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	↑245K	10Meg	0Ω	200Ω	200Ω	↑245K	10Meg	0Ω	200Ω
V2	12AX7	↑75K	100K	1000Ω	200Ω	200Ω	↑75K	220K	1000Ω	200Ω
V3	12AX7	↑485K	125K	3000Ω	200Ω	200Ω	↑65K	550K	68K	200Ω
V4	6L6G	TP	200Ω	↑100Ω	↑7500Ω	470K	TP	200Ω	200Ω	
V5	6L6G	TP	200Ω	↑100Ω	↑7500Ω	470K	TP	200Ω	200Ω	
V6	6X5GT	NC	200Ω	110Ω	NC	110Ω	TP	200Ω	30K	
V7	6X5GT	NC	200Ω	120Ω	TP	120Ω	NC	200Ω	30K	

↑ MEASURED FROM PIN 8 OF V6
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance of component values makes possible a variation of ± 15% in voltage and resistance readings
6. All controls at minimum, proper output load connected

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

SENTINEL
CHASSIS CR729AA, BA

SENTINEL
CHASSIS CR729AA, BA

TRADE NAME Sentinel Chassis CR729AA, CR729BA
MANUFACTURER Sentinel Radio Co., Fort Wayne 4, Indiana
TYPE SET Battery Operated Portable Transistorized AM Receiver

POWER SUPPLY 4 Volts RATING 9MA @ 4 Volts DC
TUNING RANGE—BROADCAST 535KC-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to antenna lug on tuning gang. Low side to chassis.	455KC (400~Mod)	Tuning gang fully open	Across earphone jack	A1, A2, A3	Adjust for maximum output.
2.		Loop	1620KC	"	"	A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal	"	A5	"
4.		"	535KC	Tuning gang fully closed	"	A6	"

Note: Chassis number was not stamped on initial production chassis. These chassis are CR729AA.

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PARTS LIST AND DESCRIPTIONS

SENTINEL
CHASSIS CR729AA

TRANSISTORS

ITEM No.	USE	TYPE	NOTES
X1	Converter	2N172	
X2	1st. IF Amplifier	2N145	Note 1
X3	2nd. IF Amplifier	2N147	Note 1
X4	AF Amplifier	310	
X5	Output	2N185	
X6	Output	2N185	

Note 1. Chassis CR729AA may use type 2N146 for X2 and X3. Chassis CR729BA may use type R03 for X2 and X3. Some CR729BA chassis may use type R02 for X2 and type R04 for X3.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	SENTINEL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	50	10	270559-5	XPP6V50	EC50-10		ML-40-6		TE-1095
C2	10	10	270559-3	XPP6V10	EC10-6	TAP25-10	ML-10-6		TE-1087
C3	50	10	270559-4	XPP6V50	EC50-6		ML-40-6		TE-1095
C4	50	10	270559-4	XPP6V50	EC50-6		ML-40-6		TE-1095
C5	50	10	270559-5	XPP6V50	EC50-6		ML-40-6		TE-1095

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SENTINEL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C6	.05	200	250753-1							
C7	10000		250756-1	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C8	16									Note 1
C9	.05	200	250753-1							
C10	10000		250756-1	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	Note 2
C11	.05	200	250753-1							
C12	50000		250753-1							
C13	10000		250756-1	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C14	10000		250756-1	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C15	18									Note 4
C16	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	Note 3
C17	100000									Note 2

Note 1. Chassis CR729BA use 10MMF in this application (Part # 250175-45).
Note 2. Not used in Chassis CR729BA.
Note 3. Some versions may use 10000MMF in this application(Part # 250756-1)
Note 4. Some versions may use 22MMF in this application (Part # 250175-44)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SENTINEL PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	5000Ω	½	230702-126					Volume & Switch

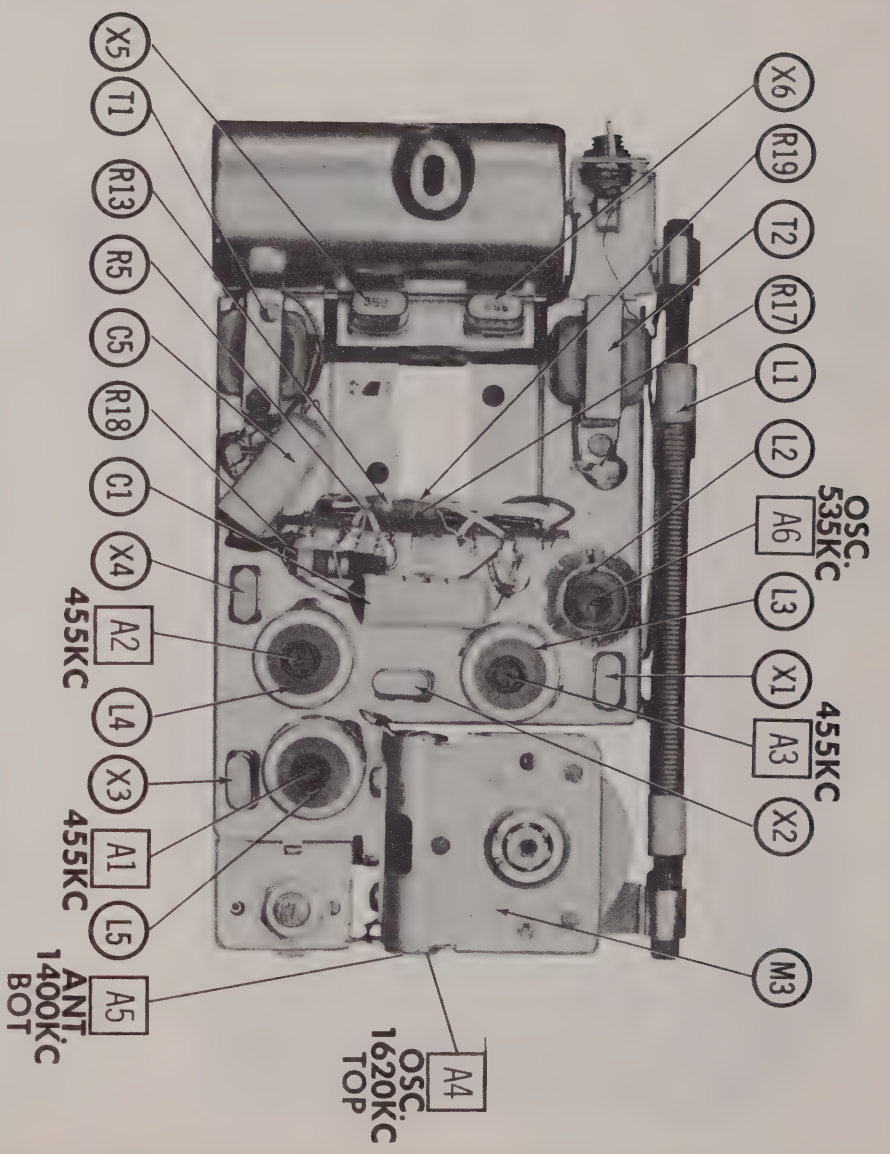
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SENTINEL PART No.	IRC PART No.	
R2	100K		230702-143	BTR-100K	
R3	220K			BTR-220K	Note 1
R4	1500Ω		230702-123	BTR-1500	
R5	39K		230702-138	BTR-39K	
R6	220Ω		230702-114	BTR-220	Note 1
R7	220Ω		230702-114	BTR-220	
R8	4700Ω		230702-128	BTR-4700	
R9	5600Ω		230702-129	BTR-5600	
R10	10000Ω		230702-122	BTR-1000	
R11	330Ω		230702-116	BTR-330	
R12	6800Ω			BTR-6800	Note 2
R13	3300Ω		230702-126	BTR-3300	
R14	5600Ω		230702-129	BTR-5600	
R15	2200Ω		230702-124	BTR-2200	
R16	470Ω		230702-118	BTR-470	
R17	100Ω		230702-110	BTR-100	Note 4
R18	4.7Ω		230109-3	BW½-4.7	
R19	100Ω		230702-110	BTR-100	
R20	15K		230702-133	BTR-15K	Note 3
R21	15K		230702-133	BTR-15K	Note 3

Note 1. Not used in Chassis CR729BA.
Note 2. 5600Ω used in some versions (Part# 230702-129)
Note 3. Not used in Chassis CR729AA.
Note 4. 68Ω used in some versions (Part # 230702-108)

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (DRIVER)

ITEM No.	Resistance PRI.	Resistance SEC.	REPLACEMENT DATA SENTINEL PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	245Ω	39.5Ω CT	320813-1				TR-4 ①		① Fabricate mounting.
	Turns Ratio								
	1.7: 1								

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA SENTINEL PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	650Ω	16Ω	320816-1				TR-20 ①		① Fabricate mounting.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT DATA SENTINEL PART No.	QUAM PART No.		NOTES
SP1	2 3/4"	PM	16Ω	580352-1			

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA SENTINEL PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Loop Stick	.1Ω	.8Ω	451512-1				
L2	Osc. Coil	2.5Ω	6.8Ω*	361225-1				* Tapped ⓐ .3Ω
L3	1st. IF Trans.	1.4Ω	.6Ω	320814-1				
L4	2nd. IF Trans.	1.4Ω	.6Ω	320814-1				
L5	3rd. IF Trans.	1.1Ω	2Ω ■	320815-1				■ Tapped ⓐ .4Ω

BATTERIES

ITEM No.	VOLTAGE	SENTINEL PART No.	REPLACEMENT DATA BURGESS "A"	BURGESS "B"	BURGESS "A-B"	EVEREADY "A"	EVEREADY "B"	EVEREADY "A-B"	MALLORY "A"	MALLORY "B"	MALLORY "A-B"
M1	4V "A"	530043-1				E223			TR-233R		

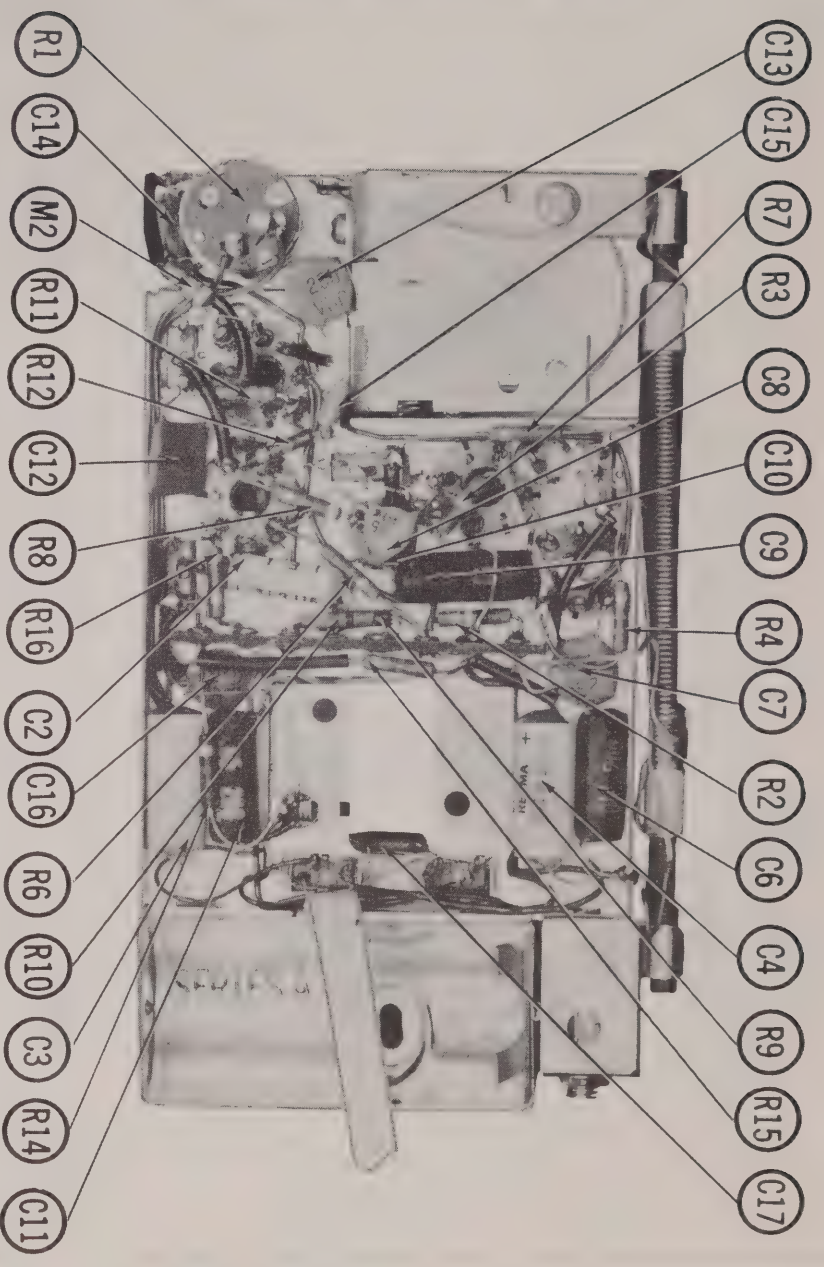
CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA SENTINEL PART No.	SYLVANIA PART No.	NOTES
M2	1N295	530553-1	1N60	Audio Det. (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	SENTINEL PART No.	NOTES
M3	Tuning Cap.	260606-1	2 Gang (19-220MMF, 23-120MMF)
	Knob	140773-2	On-Off-Volume
	Dial	140772-2	Tuning
	Cabinet Front Ass'y	884270-25	Spring Green
	Cabinet Front Ass'y	884270-28	Red
	Cabinet Front Ass'y	884270-27	Coral
	Cabinet Front Ass'y	884270-23	Ivory
	Cabinet Front Ass'y	884270-24	Olive Green
	Cabinet Front Ass'y	884270-22	Black
	Cabinet Front Ass'y	884270-26	Torquoise
	Cabinet Back	442295-1	Red
	Cabinet Back	442295-2	Ivory
	Cabinet Back	442295-3	Black

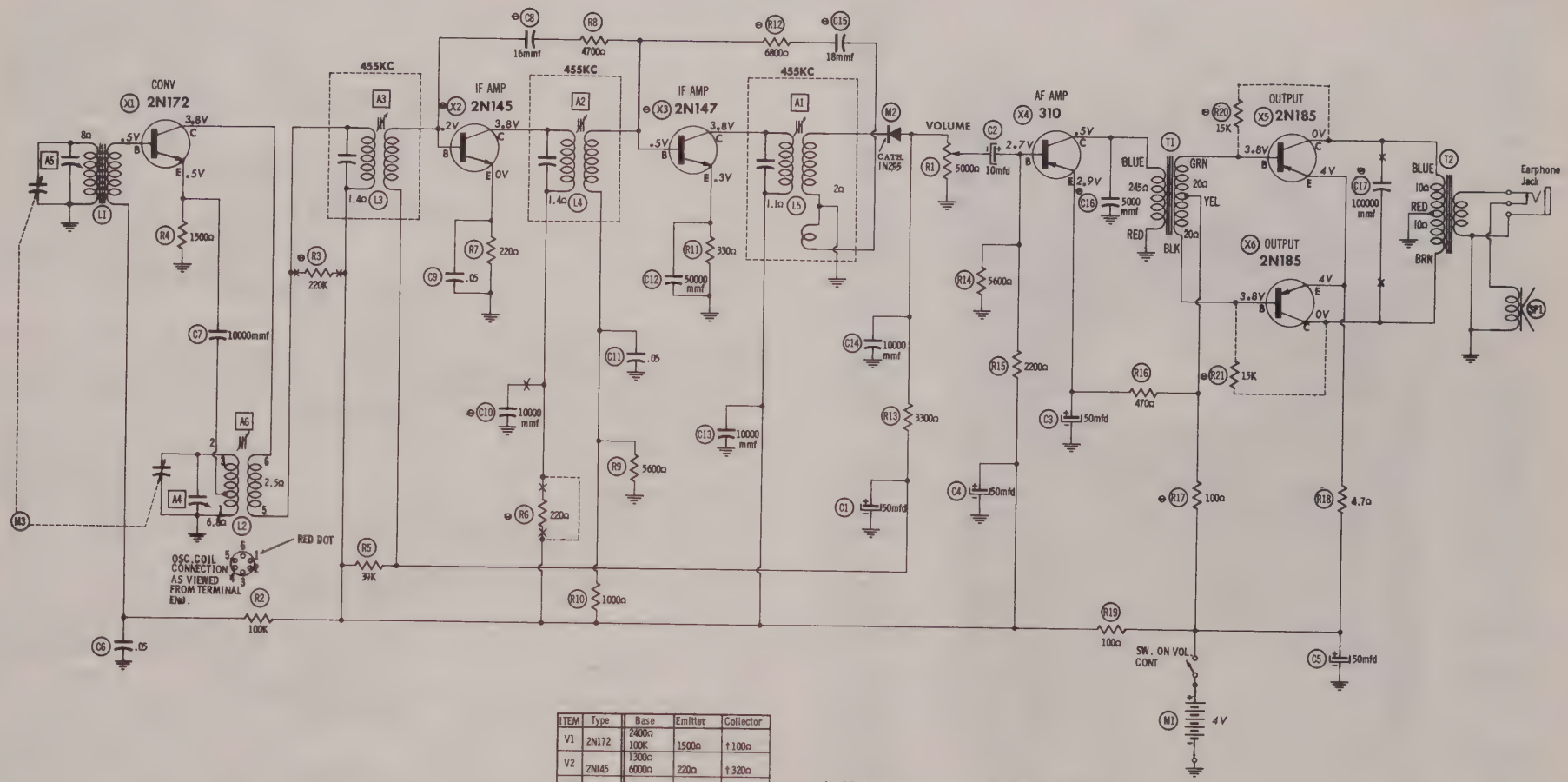
CHASSIS—BOTTOM VIEW



SET 356 FOLDER 10

SENTINEL CHASSIS CR729AA

SENTINEL CHASSIS CR729AA



ITEM	Type	Base	Emitter	Collector
V1	2N172	2400Ω 100K	1500Ω	†100Ω
V2	2N145	1300Ω 6000Ω	220Ω	†320Ω
V3	2N147	800Ω	330Ω	†100Ω
V4	310	700Ω 2800Ω	†550Ω	200Ω
V5	353	†120Ω	†4.7Ω	10Ω
V6	353	†120Ω	†4.7Ω	10Ω

† MEASURED FROM POSITIVE SIDE OF C5. DUAL READING INDICATES REVERSAL OF METER LEADS.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

1. DC voltage measurements taken with vacuum tube voltmeter;
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum. no signal applied for voltage measurements.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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SONORA
MODELS 502, 604

SONORA
MODELS 502, 604

TRADE NAME	Sonora Models 502, 604
MANUFACTURER	Sonora Radio & Tel. Corp., 325 N. Hoyne Ave., Chicago, Ill.
TYPE SET	Three Power Portable 2 Band AM Receiver
TUBES (Five)	Types 1U4 RF Amplifier, 1L6 Converter, 1U4 IF Amplifier, 1U5 Det.-AVC-AF Amp., 3V4 Output
POWER SUPPLY	100-120 Volts AC-DC (or) 9 Volt "A" Supply & 90 Volt "B" Supply in Pack Form
RATING	.1 Amp. @ 117 Volts AC (or) 55MA @ 9 Volts DC & 9.5MA @ 90 Volts DC
TUNING RANGE—BROADCAST	540KC - 1620KC SHORT WAVE 5.8MC - 18.3MC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Use battery power, if possible. If AC power is used, use an isolation transformer when available. If not, connect a .1MFD capacitor in series with low side of the signal generator and B-.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 6 (grid) of 1L6 (V2). Low side to B-.	455KC (400∿Mod)	BC	Point of non-interference	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200MMF to reduce hum modulation.
	Check for image frequency by setting signal generator to approximately 19.3MC and increasing generated signal. If signal fails to appear, reset signal generator to 18.4MC and decrease capacity of A5 until signal is received. Recheck for image.							
2.	"	"	18.4MC	SW	Tuning gang fully open	"	A5	Set A6 and A7 for maximum capacity. Adjust A5 for maximum output using peak signal obtained with trimmer screw farthest out of trimmer.
3.		Loop	15MC	SW	15MC	"	A6, A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
4.		"	1620KC	BC	Tuning gang fully open	"	A8	"
5.		"	1400KC	"	1400KC	"	A9, A10	"
6.		"	600KC	"	600KC	"	A11	Adjust for maximum output while rocking tuning gang. Repeat steps 4, 5 and 6.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	1U4	
V2	Converter	1L6	
V3	IF Amplifier	1U4	

ITEM No.	USE	TYPE	NOTES
V4	Det.-AVC-AF Amp.	1U5	
V5	Output	3V4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA SONORA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲50	150	R-1095	AFH4-38	D0330	FP411	TMQ-37	Q-110	TVL-4425.3
B	■40	150							
C	▲40	150							
D	100	15							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	SONORA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	3		R-1104	NP0-SI3	TCZ-3R3	TZ06	NP0A-030	ZT-553	5TCCB-V33	
C3	6.8		R-1271	NP0-SI6.8	TCZ-6R8	TZ08	NP0A-6R8	ZT-5568	5TCCB-V68	Note 1
C4	10000		N-9062	BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C5	100		N-6015	SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C6	10000		N-9062	BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C7	10000		N-9062	BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C8	5000		N-6272	BPD-005	DD-502	K080	811-005	DC525	5HK-D5	
C9	6.8		R-1271	NP0-SI6.8	TCZ-6R8	TZ08	NP0A-6R8	ZT-5568	5TCCB-V68	Note 1
C10	10000		N-9062	BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C11	10000		N-9062	BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C12	.33		R-1154							
C13	50		N-6375	NP0-SI50	TCZ-50	TZ23	NP0-338-500	ZT-545	5TCC-Q5	
C14	4000	500	N-1690	1464-004		1R5D4		MCE463	MS-24	
C15	575	500	R-1106							
C16	5000		N-6272	BPD-005	DD-502	K080	811-005	DC525	5HK-D5	
C17	10000		N-9062	BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C18	.1	200	N-1351	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C19	2000		R-1105	BPD-002	DD-202	K072	801-002	DC-522	5HK-D2	
C20	.1	200	N-1351	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C21A	150					G046	811-151	UC-5315		
B	2000					K072	801-002	DC522		
C	150		♦R-1119	♦PA-521	♦PC-165	G046	811-151	UC-5315	♦DP-1	
D	10000					K082	811-01	DC511		
E	5000					K080	811-005	DC525		
C22	.05	200	N-1345	BPD-05	DF-503	CUB2S5		GEM-415	2TM-S5	
C23	2000		R-1105	BPD-002	DD-202	K072	801-002	DC522	5HK-D2	
C24	2000		R-1105	BPD-002	DD-202	K072	801-002	DC522	5HK-D2	
C25	.1	200	N-1351	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C26	2000		R-1105	BPD-002	DD-202	K072	801-002	DC522	5HK-D2	
C27	.047	400	N-1346	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	

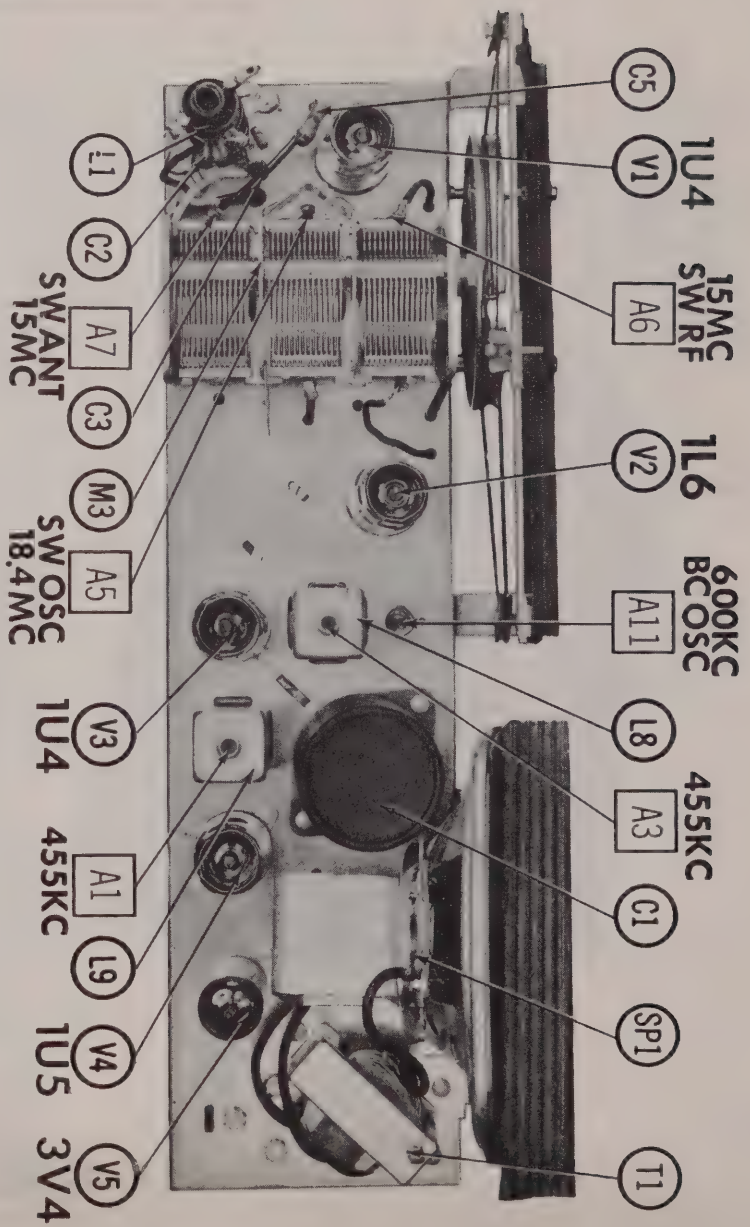
♦ Items C21A, C21B, C21C, C21D, C21E, R17A, R17B, R17C and R17D are combined in one unit.

Note 1. Some versions may use 10 MMF in this application (Part # N-9048)

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	SONORA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	½	R-1081	B-70-S	A47-1Meg-Z	Q13-137	U53	Volume
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			Not Req.	SWE-20	76-2	US-27	
R2A	2Meg	½	R-1082	AB-76	A47-2Meg-Z	Q13-139	U55	Tone
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SONORA PART No.	IRC PART No.	
R3	47K			BTS-47K	Note 1
R4	2.7Meg		N-8027	BTS-2.7Meg	
R5	3.3Meg		R-1109	BTS-3.3Meg	
R6	1000Ω		N-3341	BTS-1000	
R7	1000Ω		N-1694	BTS-1000	
R8	27K		N-4451	BTS-27K	
R9	47K			BTS-47K	Note 1
R10	180K		N-7003	BTS-180K	
R11	68K		N-5693	BTS-68K	
R12	1Meg		N-1262	BTS-1Meg	
R13	220Ω		N-5348	BTS-220	
R14	1500Ω		N-7398	BTS-1500	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SONORA PART No.	IRC PART No.	
R15	1800Ω		N-4281	BTS-1800	
R16	6.8Meg		N-4028	BTS-6.8Meg	
R17A	10Meg			BTS-10Meg	
B	4.7Meg		♦R-1119	BTS-4.7Meg	
C	1Meg			BTS-1Meg	
D	3.3Meg			BTS-3.3Meg	
R18	1500Ω		N-3398	BTS-1500	
R19	100Ω	2.5	R-1152	PW4-100	
R20	82Ω		N-5857	BTS-82	
R21	470Ω	1	N-4421	BTA-470	
R22	3300Ω	3	R-1151	PW7-3300	
R23	4700Ω		N-7018	BTB-4700	

♦ Items R17A, R17B, R17C, R17D, C21A, C21B, C21C, C21D, C21E are combined in one unit.

Note 1. Not used in some versions

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	SONORA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	9200Ω	3.8Ω	R-1080	Z1117	A-2932	A-3879	24S52	S-17X	

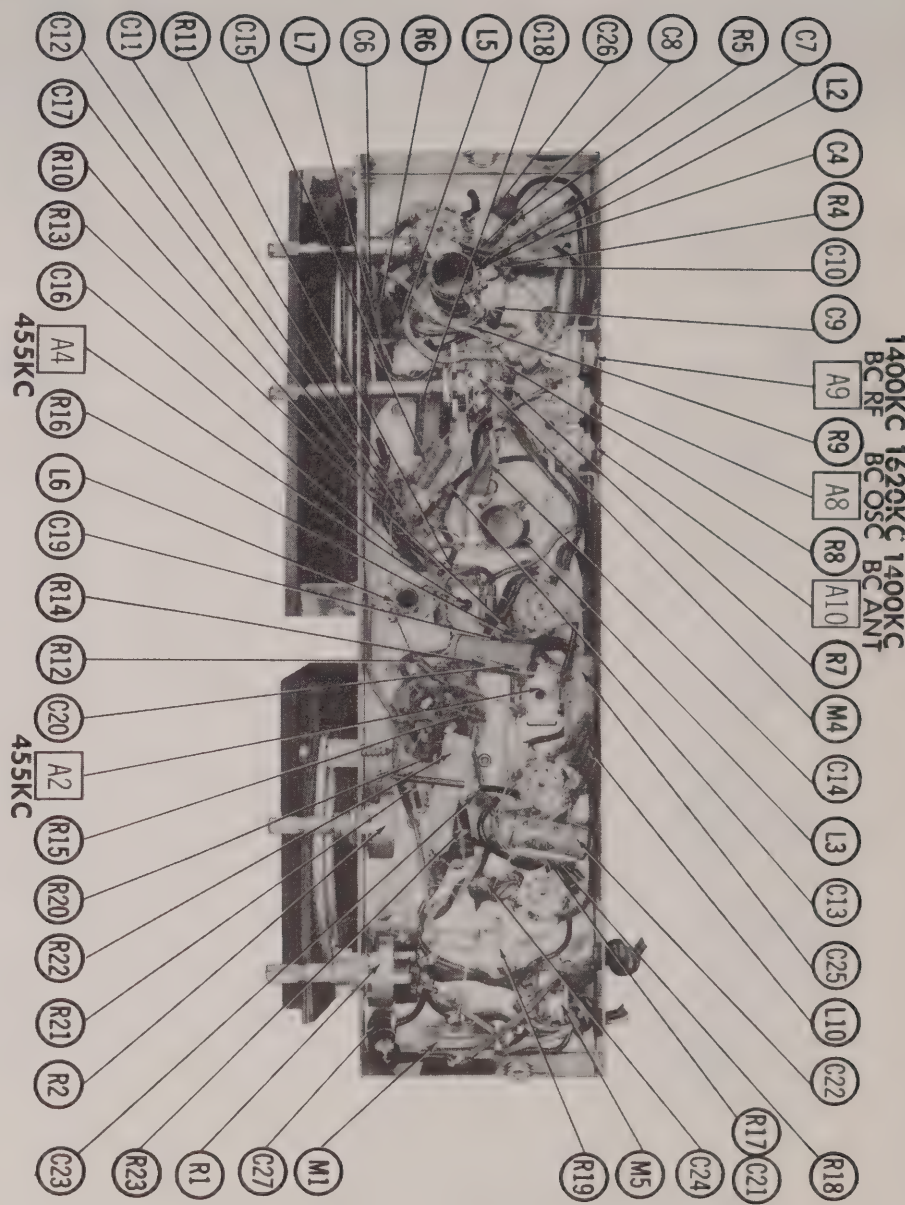
SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	SONORA PART No.	QUAM PART No.		
SP1	5"	PM	3.8Ω	R-1116	5A1		

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	SONORA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	SW Ant. Coil	5.3Ω	0Ω	R-1097	14-1044			
L2	SW RF Coil	1Ω	0Ω	R-1098	14-1045			
L3	SW Osc. Coil	.5Ω	0Ω	R-1099				
L4	BC Loop Ant.	2Ω		R-1086				Includes cabinet back
L5	BC RF Coil	8.5Ω		R-1101	19-4201		6154	
L6	BC Osc. Coil	.8Ω	2.9Ω	R-1102	14-1040	BC-387	71-OSC	
L7	Fil. Choke	0Ω		R-1172	19-1000		4602	1 Microhenry
L8	Input IF	14Ω	14Ω	N-7981	16-6758	BC-352	12-C1	
L9	Output IF	14Ω	14Ω	N-7981	16-6758	BC-353	12-C2	
L10	RF Choke	0Ω		R-1160				

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SELENIUM RECTIFIER

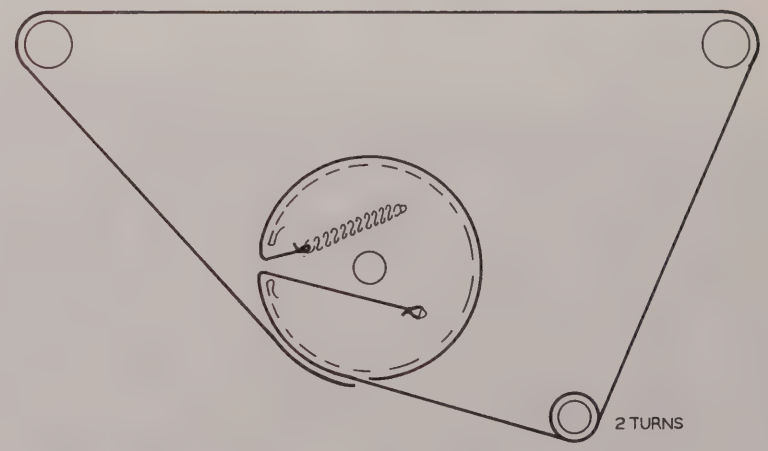
ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	SONORA PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.054A	N-8331	1263A	RS065	6S65	8J1	65	

BATTERIES

ITEM No.	VOLTAGE	SONORA PART No.	REPLACEMENT DATA								
			BURGESS			EVEREADY			MALLORY		
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	"A"	"B"	"A-B"
M2	9 V "A" 90V "B"				F6A60			753			A-401

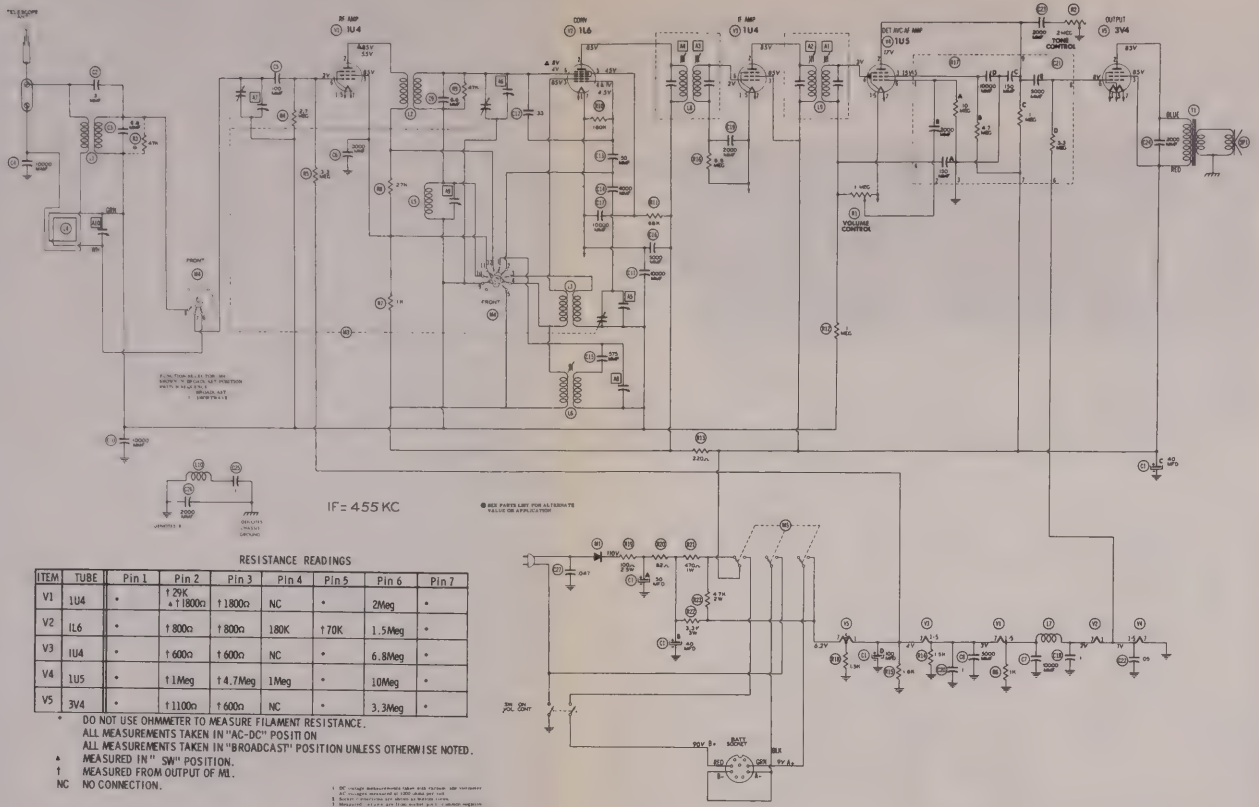
MISCELLANEOUS

ITEM No.	PART NAME	SONORA PART No.	NOTES
M3	Tuning Cap.	R-1062	3 Gang (16-455MMF, 16-455MMF, 16-455MMF)
M4	Switch	R-1049	Band (Rotary-wafer type)
M5	Switch	R-1103	Power Changeover (3 pole- 2 position)
M6	Trimmer Cap.	R-1083	3 Section: Sw. Osc. (A5), BC Osc. (A8), BC RF (A9).
	Antenna	R-1120	Telescope



TUNING GANG FULLY CLOSED

DIAL CORD STRINGING



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	1U4	*	↑ 29K ▲ ↑ 1800Ω	↑ 1800Ω	NC	*	2Meg	*
V2	1L6	*	↑ 800Ω	↑ 800Ω	180K	↑ 70K	1.5Meg	*
V3	1U4	*	↑ 600Ω	↑ 600Ω	NC	*	6.8Meg	*
V4	1U5	*	↑ 1Meg	↑ 4.7Meg	1Meg	*	10Meg	*
V5	3V4	*	↑ 1100Ω	↑ 600Ω	NC	*	3.3Meg	*

* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.
ALL MEASUREMENTS TAKEN IN "AC-DC" POSITION
ALL MEASUREMENTS TAKEN IN "BROADCAST" POSITION UNLESS OTHERWISE NOTED.
▲ MEASURED IN " SW" POSITION.
↑ MEASURED FROM OUTPUT OF M1.
NC NO CONNECTION.

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PHOTOFACT* Folder

*TRADE MARK

RETMA MEMBER

SONORA
MODELS 606, 615

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SONORA MODEL 606

TRADE NAME	Sonora Models 606, 615
MANUFACTURER	Sonora Radio & Tel. Corp., 325 North Hoyne Avenue, Chicago, Illinois
TYPE SET	Television Receiver
TUBES	Twelve
POWER SUPPLY	110-120 Volts AC - 60 Cycle RATING 1.14 Amp@ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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SONORA
MODELS 606, 615

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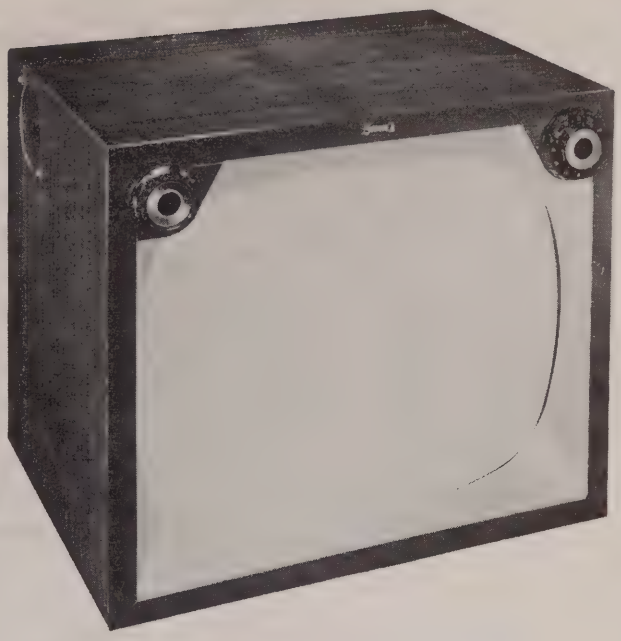
DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 4 push-on type control knobs from front.
2. Remove 2 metal screws holding volume control to cabinet.
3. Remove 12 wood screws, remove rear cover.
4. Remove 7 wood screws from bottom of cabinet.
5. Remove speaker leads.
6. Remove chassis.
7. Remove 2 speaker nuts, remove speaker.



CAUTION NOTE

ONE SIDE OF AC LINE CONNECTED TO CHASSIS

Care should be exercised when connecting test equipment or physcially contacting chassis.

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO
MODEL 606

SONORA
MODELS 606, 615

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

For touch-up adjustment of VHF tuner oscillator, it is necessary to remove the chassis from the cabinet. (See Disassembly Instructions.)

PICTURE TUBE SAFETY GLASS CLEANING

For picture tube safety Glass cleaning, it is necessary to remove chassis. (See disassembly instructions.)

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 3.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

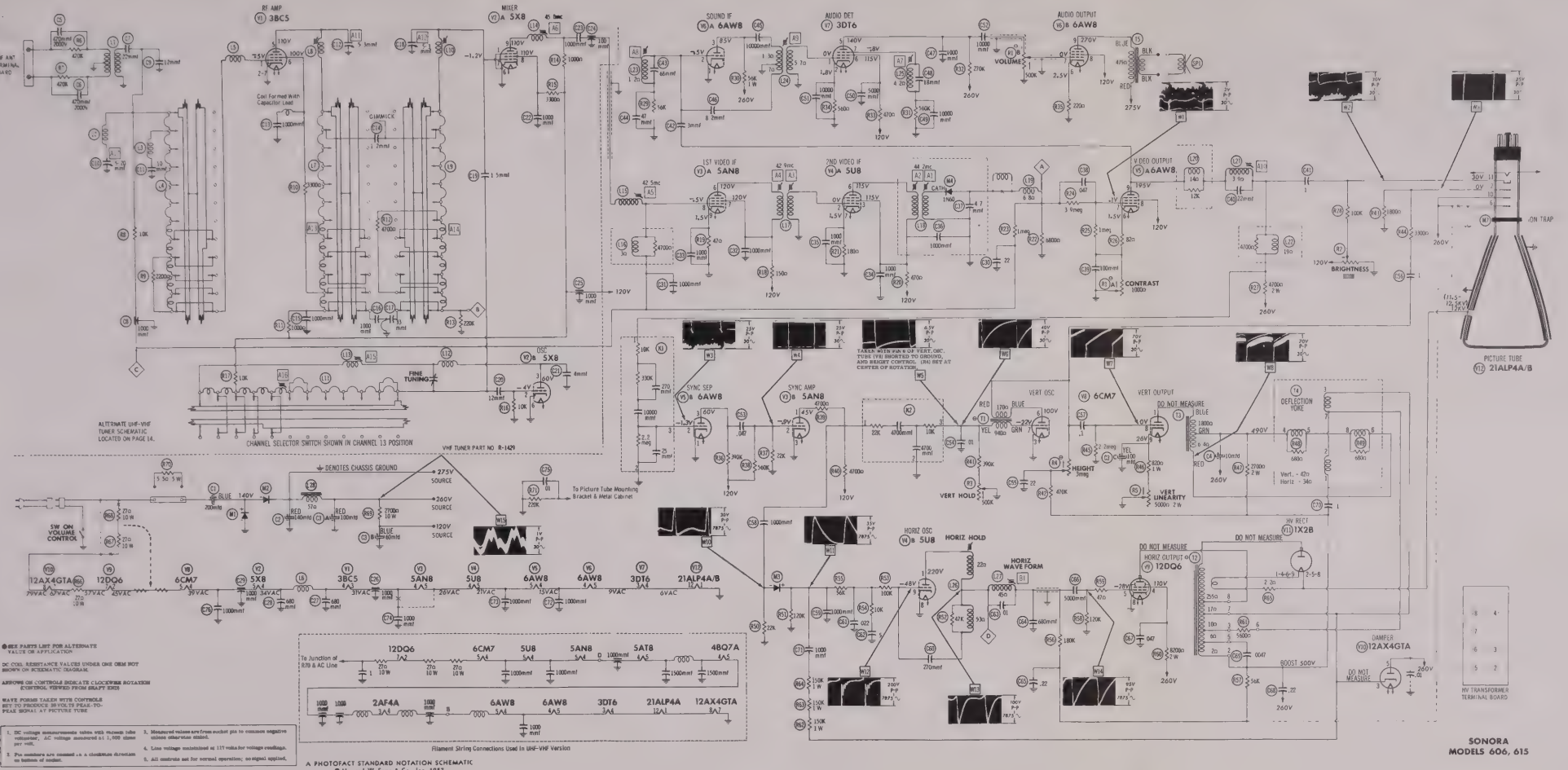
The horizontal frequency slug is located on the rear of the set and is used as the horizontal hold control. Adjust the horizontal hold until the picture synchronizes horizontally.

FUSES

A 5.5Ω fusible resistor (R70) is used for LV power supply protection.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1957 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under international Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America


SONORA
MODELS 606, 615
RF AMP
Y1 3BC5
MIXER
Y2 A 5X8
SOUND IF
V6 A 6AW8
AUDIO DET
V7 3DT6
AUDIO OUTPUT
V6 B 6AW8
VOLUME
1ST VIDEO IF
Y3 A 5AN8
2ND VIDEO IF
Y4 A 5U8
VIDEO OUTPUT
Y5 A 6AW8
CONTRAST
BRIGHTNESS
PICTURE TUBE
Y12 21ALP4A/B
VHF ANT TERMINAL BOARD
Coil Formed With Capacitor Lead
GIMMICK
FINE TUNING
OSC
Y7 B 5X8
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
ALTERNATE UHF-VHF TUNER SCHEMATIC LOCATED ON PAGE 14.
VHF TUNER PART NO R-1429
DENOTES CHASSIS GROUND
275V SOURCE
260V SOURCE
120V SOURCE
To Picture Tube Mounting Bracket & Metal Cabinet
SW ON VOLUME CONTROL
SYNC SEP
V5 B 6AW8
SYNC AMP
Y3 B 5AN8
VERT OSC
V8 6CM7
VERT OUTPUT
VERT HOLD
HEIGHT
VERT LINEARITY
DEFLECTION YOKE
Vert. - 42∞
Horiz - 34∞
DO NOT MEASURE
HORIZ OSC
V4 B 5U8
HORIZ HOLD
HORIZ WAVE FORM
HORIZ OUTPUT
V9 12DQ6
HV RECT
Y11 1X2B
DAMPER
Y10 12AX4GTA
BOOST 500V
HV TRANSFORMER TERMINAL BOARD
ION TRAP
TAKEN WITH PIN 6 OF VERT. OSC. TUBE (Y8) SHORTED TO GROUND, AND BRIGHT CONTROL (R4) SET AT CENTER OF ROTATION
12AX4GTA
12DQ6
6CM7
5X8
3BC5
5AN8
5U8
6AW8
6AW8
3DT6
21ALP4A/B
12AL
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER OHMS NOT SHOWN ON SCHEMATIC DIAGRAM.
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 30 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE
1. DC voltage measurements taken with vacuum tube voltmeter. AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are shown in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.
To Junction of R70 & AC Line
12DQ6
6CM7
5U8
5AN8
5AT8
48Q7A
2AF4A
6AW8
6AW8
3DT6
21ALP4A
12AX4GTA
Filament String Connections Used in UHF-VHF Version
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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TUBE PLACEMENT CHART

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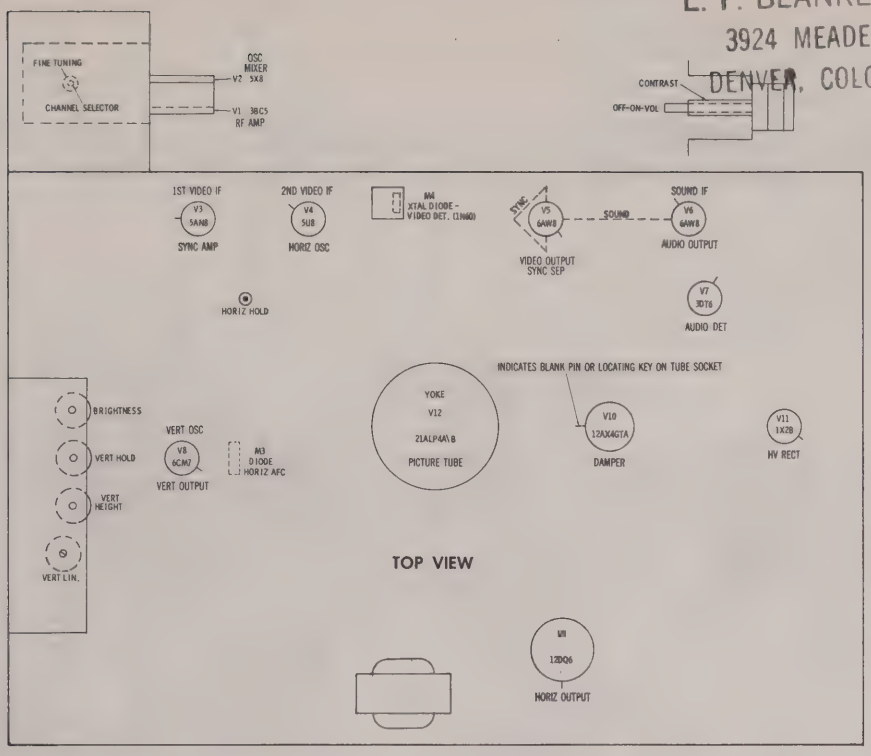


TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

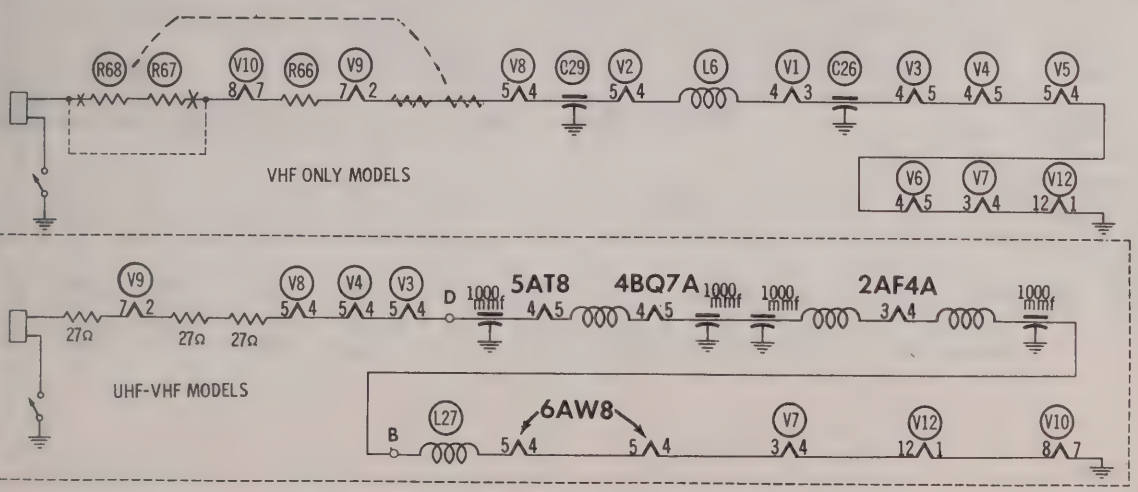
POWER SUPPLY FAILURE
No raster, no sound - **Fusible Resistor (R70), Rectifiers (M1, M2)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V3, V4, Diode (M4), V5, V12**
No pic, no sound, has snow - **V1, V2**
No pic, has sound, has raster - **V5, V12**
Has pic, no sound - **V6, V7**

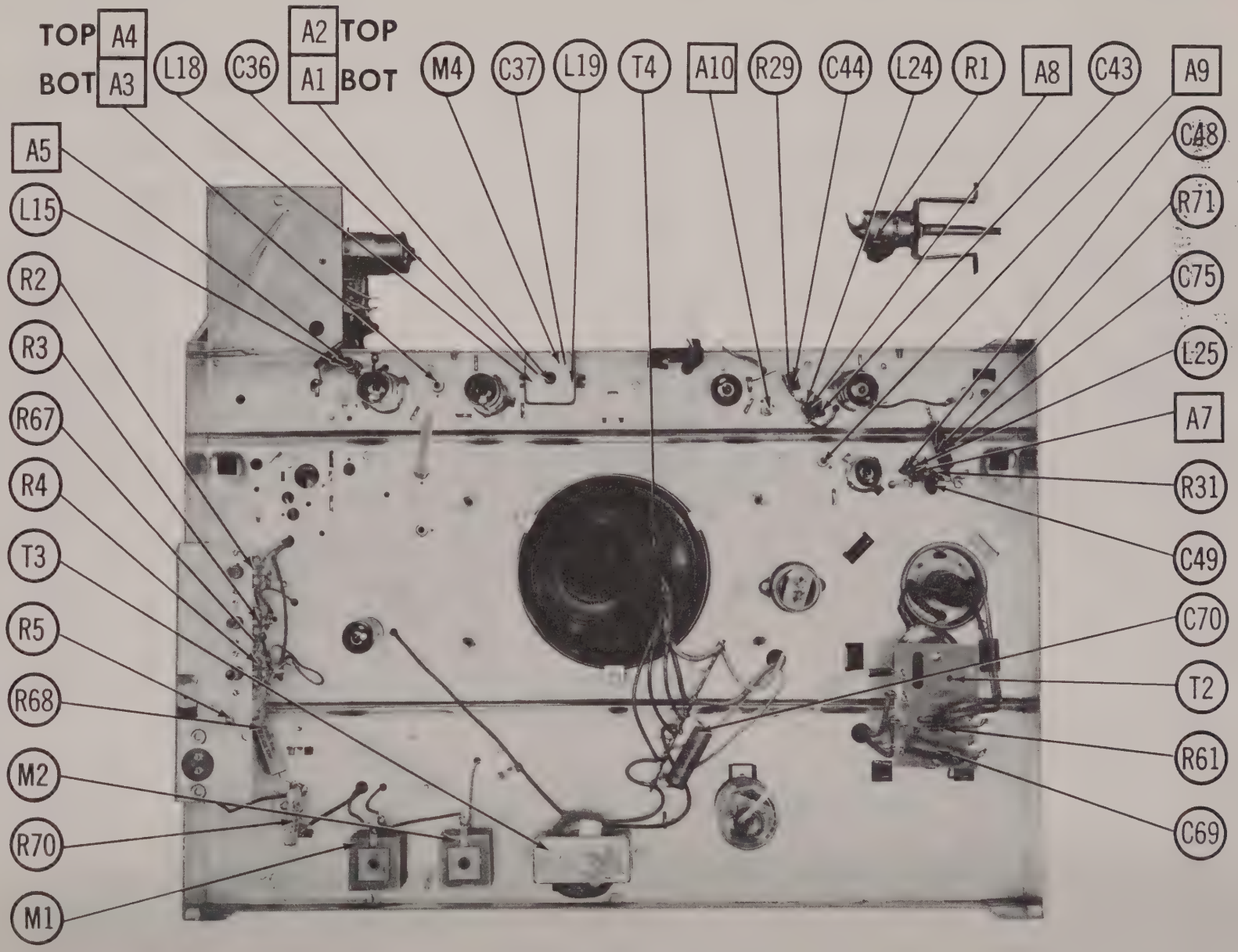
SYNC FAILURE
No vert. sync - **V5, V3, V8**
No horiz. sync - **V5, V3, Diode (M3), V4**
No vert. or horiz. sync - **V5, V3**

SWEEP FAILURE
No raster, has sound - **V4, V9, V10, V11**
No vertical deflection - **V8**
Poor vert. linearity or foldover - **V8**
Poor horiz. linearity or foldover - **V4, V9, V10**
Narrow picture - **V4, V9, V10, M1, M2**
Vert. off freq. - **V5, V3, V8**
Horiz. off freq. - **V5, V3, M3, V4**

Since this receiver employs tubes used in a series filament network, an open filament in any tube in the series will cause the set to be inoperative. (See circuit below).



SET 356 FOLDER 12



CHASSIS TOP VIEW

PROPERTY OF
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DENVER, COLORADO

CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

MODELS 606, 615

SONORA

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis.
Use an isolation transformer to protect the test equipment.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt bias supply to the ungrounded side of C30. Positive lead to chassis.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over converter tube (V2). Low side to chassis.	Not Used.	44.2MC (unmod)	Any unused channel.	USE VTVM DC probe to point (A). Common to chassis.	A1, A2	Adjust for maximum deflection. Tune for peak with slug farthest apart. Use only enough sweep generator output to provide usable indication on VTVM.
2.	"	"	"	42.9MC	"	"	A3, A4	"
3.	"	"	"	42.5MC	"	"	A5	"
4.	"	"	"	45.0MC	"	"	A6	"
5.	"	"	44MC (10MC Swp)	41.25MC 42.6MC 45.75MC	"	Vert. amp. thru 10K to point (A). Low side to chassis.		Check for response similar to Fig. 1 with markers placed as indicated. If necessary, retouch A1 thru A6 SLIGHTLY to obtain desired response. More than 1 full turn on any adjustment in either direction should not be required.

SOUND IF ALIGNMENT

Turn the set on and tune in a strong TV signal. Adjust A7 for maximum volume. Disconnect antenna and if necessary, use an attenuator between the antenna and the antenna terminals to provide a weak signal. Adjust A8 and A9 for maximum volume. (A weak signal is necessary to make the peaks distinguishable.)
Connect the antenna directly to the antenna terminals for a strong signal and retouch A7 for maximum volume.

4.5MC TRAP ALIGNMENT

Tune in a TV station and adjust the fine tuning until a 4.5MC beat pattern appears in the picture. Turn A10 fully counter clockwise, then clockwise until the horizontal scanning lines are smooth and continuous (beat pattern disappears).

RF AND MIXER ALIGNMENT FOR TUNER #R-2409

Disconnect AGC lead from terminal 1 (point (C)) and connect the negative lead of a 1.5 volt bias battery to the terminal. Connect the positive lead to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. amp. thru 10K to point (B). Low side to chassis.	A11, A12	Adjust A11 and A12 for maximum response similar to Fig. 2.
7.	"	"	177MC (10MC Swp)	175.25MC 179.75MC	7	"		Check for response curve similar to Fig. 2. SLIGHTLY retouch A11 and A12 for desired response. Recheck step 6 and adjust A11 and A12 for best compromise, if necessary.
8.	"	"	85MC (10MC Swp)	83.25MC 87.75MC	6	"	A13, A14	Check for response similar to Fig. 2. If necessary, remove cover and adjust A13 and A14 to obtain desired response. Adjust by expanding or compressing coil turns. Replace cover and recheck response curve.
9.	"	"	57MC (10MC Swp)	55.25MC 59.75MC	2	"		Check for response curve similar to Fig. 2. SLIGHTLY retouch A13 and A14 for desired response, if necessary. Recheck step 8 and adjust A13 and A14 for best compromise.

OSCILLATOR ALIGNMENT FOR TUNER #R-2409

Leave bias connected as under "RF and Mixer Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Two 120Ω carbon resistors.	Across the antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. amp. thru 10K to point (A). Low side to chassis.	A15	Adjust to place sound marker in trap notch as in Fig. 3. Video marker should fall at 50%.
11.	"	"	85MC (10MC Swp)	83.25MC 87.75MC	6	"	A16	"

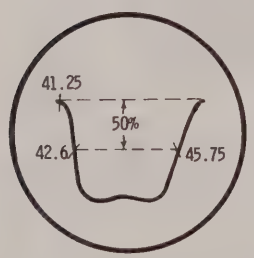


FIG. 1

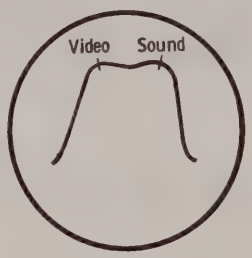


FIG. 2

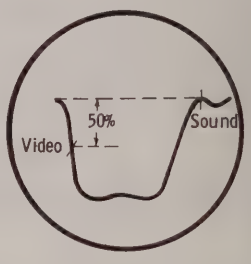


FIG. 3

ALIGNMENT INSTRUCTIONS (cont)

VHF OSCILLATOR ALIGNMENT FOR ALTERNATE UHF-VHF TUNER

Connect the negative lead of a 3 volt bias supply to point (C). Connect the positive lead to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω carbon resistors.	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211. 25MC 215. 75MC	13	Vert. amp. thru 47K to point (A). Low side to chassis.	A18	Adjust to place sound marker in trap notch as in Fig. 3. Video marker should fall at 50%.
			207MC (10MC Swp)	205. 25MC 209. 75MC	12		A19	
			201MC (10MC Swp)	199. 25MC 203. 75MC	11		A20	
			195MC (10MC Swp)	193. 25MC 197. 75MC	10		A21	
			189MC (10MC Swp)	187. 25MC 191. 75MC	9		A22	
			183MC (10MC Swp)	181. 25MC 185. 75MC	8		A23	
			177MC (10MC Swp)	175. 25MC 179. 75MC	7		A24	
			85MC (10MC Swp)	83. 25MC 87. 75MC	6		A25	
			79MC (10MC Swp)	77. 25MC 81. 75MC	5		A26	
			69MC (10MC Swp)	67. 25MC 71. 75MC	4		A27	
			63MC (10MC Swp)	61. 25MC 65. 75MC	3		A28	
			57MC (10MC Swp)	55. 25MC 59. 75MC	2		A29	

VHF RF AND MIXER ALIGNMENT FOR ALTERNATE UHF-VHF TUNER

Connect bias as under "VHF RF and Mixer Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Two 120Ω carbon resistors.	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205. 25MC 209. 75MC	12	Vert. amp. thru 10K to point (E). Low side to chassis.	A30, A31, A32	Adjust for response curve similar to Fig. 2 with markers above 90%.
14.	"	"	213MC (10MC Swp)	211. 25MC 215. 75MC	13	"		Check for response similar to Fig. 2. If markers fall below 70% on any channel, make compromise adjustments of A30, A31 and A32 with channel switch set to that channel. Check all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199. 25MC 203. 75MC	11			
			195MC (10MC Swp)	193. 25MC 197. 75MC	10			
			189MC (10MC Swp)	187. 25MC 191. 75MC	9			
			183MC (10MC Swp)	181. 25MC 185. 75MC	8			
			177MC (10MC Swp)	175. 25MC 179. 75MC	7			
			85MC (10MC Swp)	83. 25MC 87. 75MC	6			
			79MC (10MC Swp)	77. 25MC 81. 75MC	5			
			69MC (10MC Swp)	67. 25MC 71. 75MC	4			
			63MC (10MC Swp)	61. 25MC 65. 75MC	3			
			57MC (10MC Swp)	55. 25MC 59. 75MC	2			

UHF TUNER ALIGNMENT FOR ALTERNATE UHF-VHF TUNER

Connect the negative lead of a 3 volt bias supply to the ungrounded side of C30. Connect the positive lead to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
15.	Two 120Ω carbon resistors.	Across UHF antenna with 120Ω in each lead.	803MC (20MC Swp)	801. 25MC 805. 75MC	69	Vert. amp. thru 10K to point (F). Low side to chassis.	Fine tuning.	Adjust fine tuning to place markers within 30% of peak response.
16.	"	"	"	"	"	Vert. amp. thru detector (Fig. 4) to place (Pin 6) of 1st Video IF (V3). Low side to chassis.	A33	Remove tuner shield and channel 9 strip to provide access to A33. Adjust A33 for maximum gain and response similar to Fig. 5. Check other UHF channels and make compromise adjustments on A33 if necessary, to obtain best response curve on all UHF channels.

41MC IF INTERFERENCE TRAP ALIGNMENT

If interference is noted on any channel, adjust A17 for MINIMUM interference on that channel.

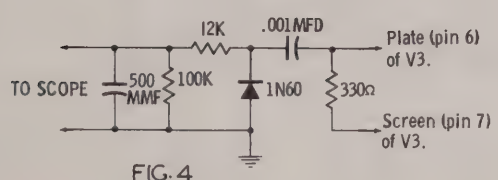


FIG. 4

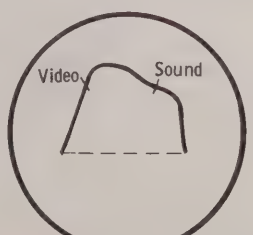
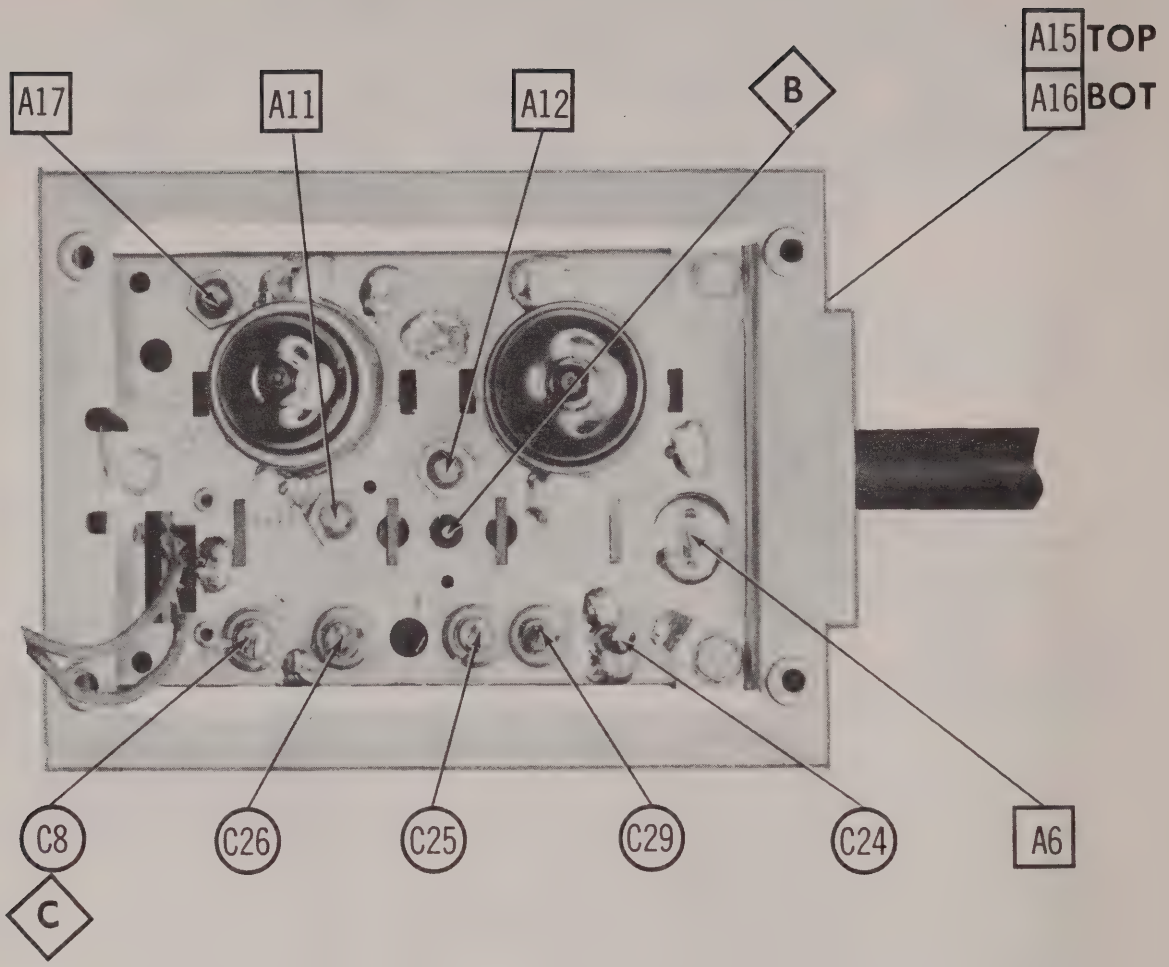
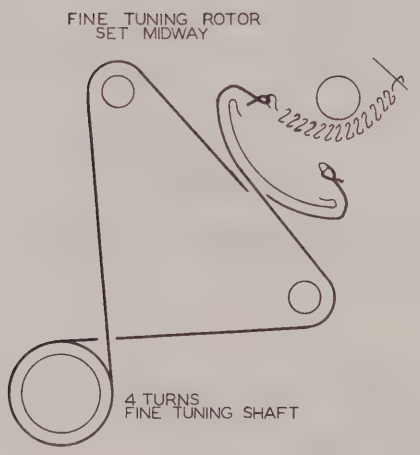


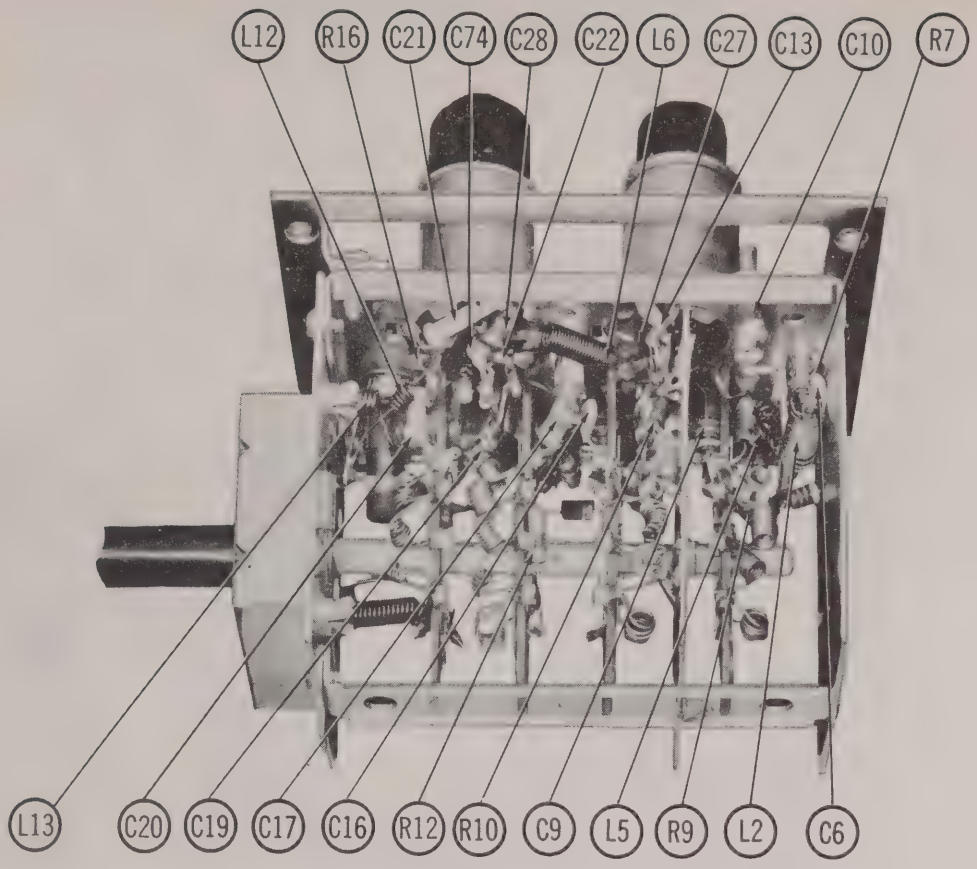
FIG. 5



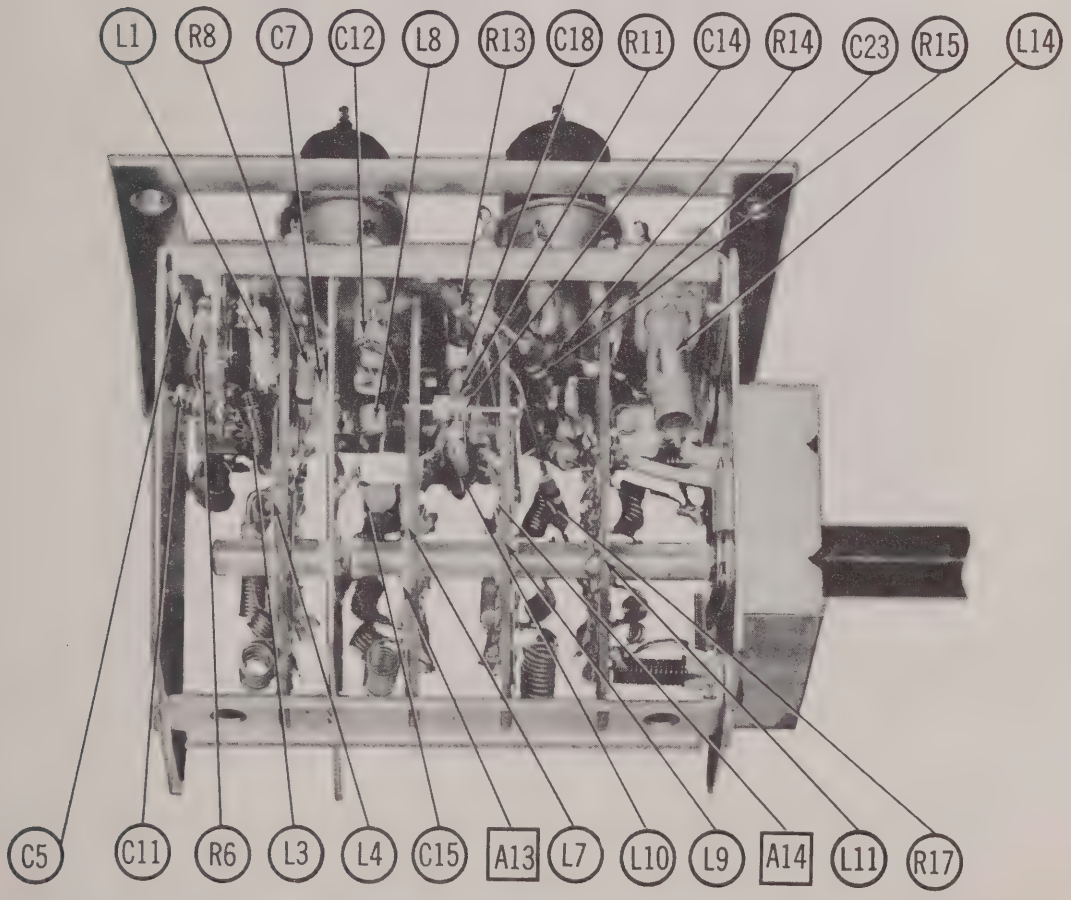
RF TUNER TOP VIEW



FINE TUNING DRIVE CORD STRINGING



RF TUNER-RIGHT SIDE

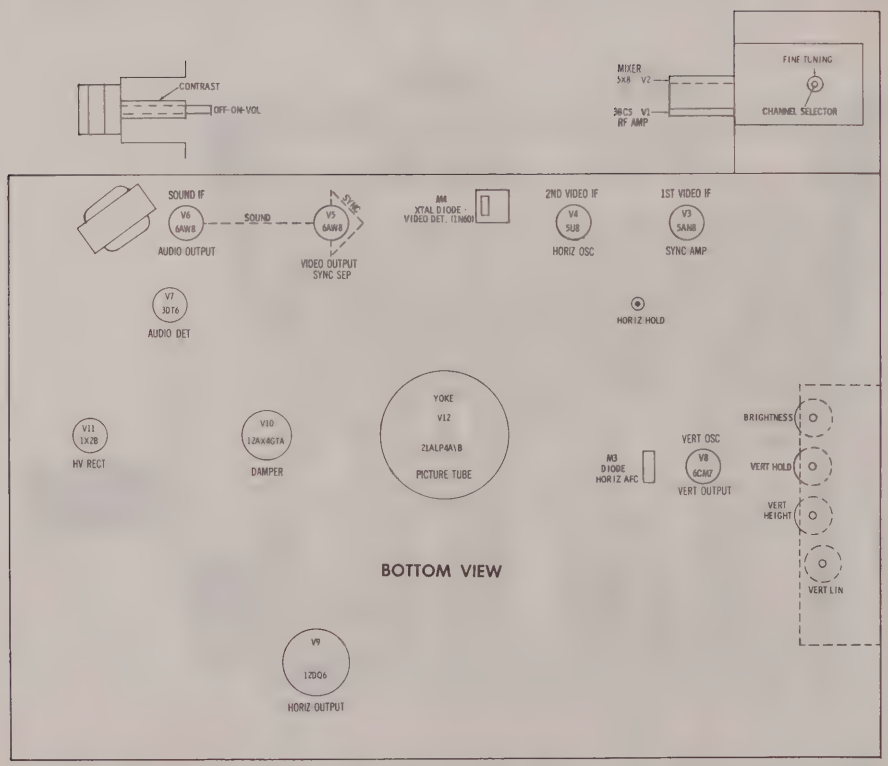


RF TUNER-LEFT SIDE

RESISTANCE MEASUREMENTS

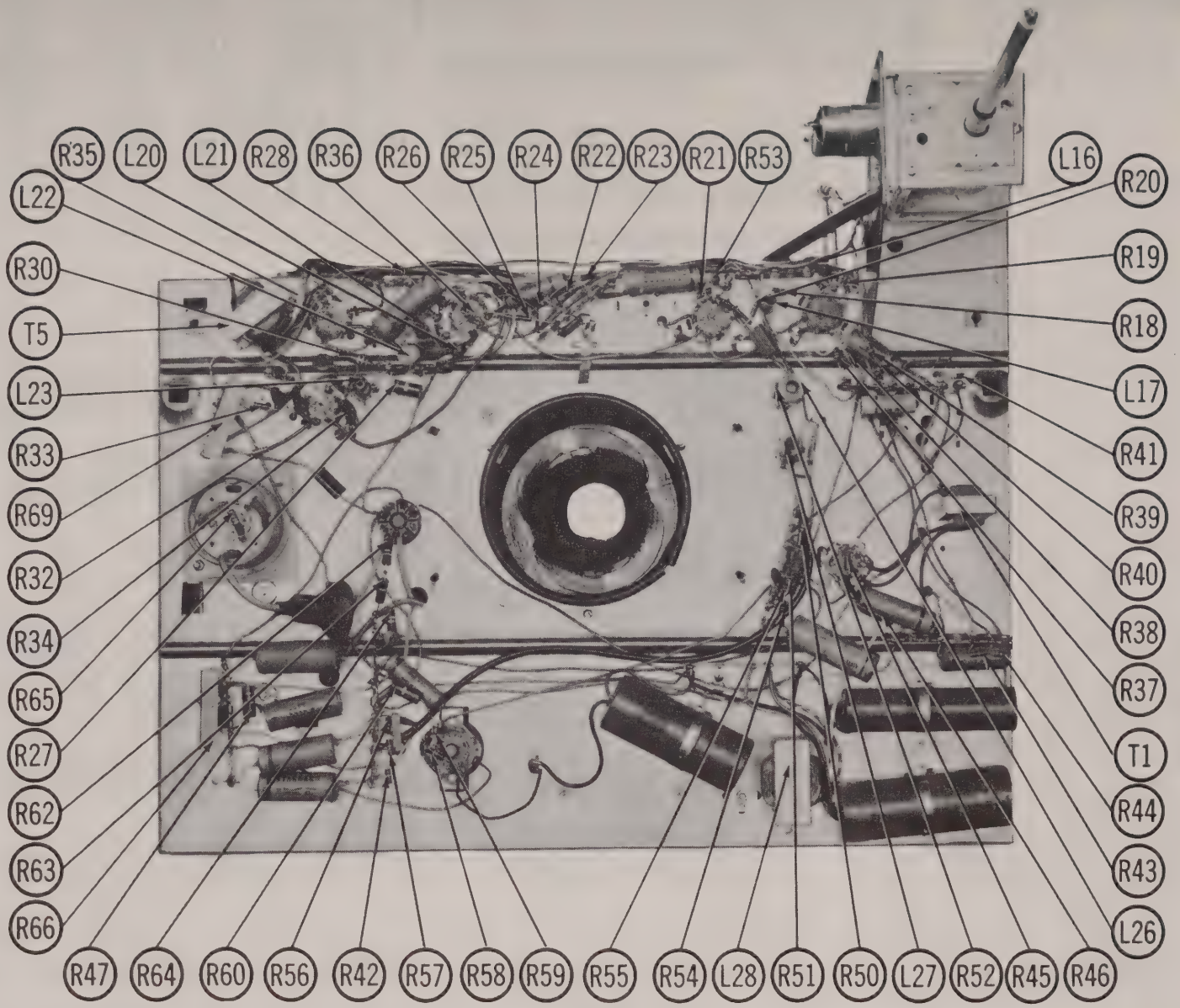
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3BC5	1.1Meg	0Ω	8Ω	8.5Ω	†3700Ω	†7000Ω	0Ω		
V2	5X8	0Ω	10K	†13K	8.5Ω	10Ω	0Ω	220K	†6000Ω	†3800Ω
V3	5AN8	†13K	22K	0Ω	8Ω	6.8Ω	†2900Ω	†2900Ω	1Meg	47Ω
V4	5U8	*240K	.1Ω	†3200Ω	6.8Ω	5.5Ω	†3200Ω	180Ω	0Ω	230K
V5	6AW8	0Ω	2.2Meg	†390K	4Ω	5.5Ω	95Ω	900K	†2700Ω	†5000Ω
V6	6AW8	0Ω	56K	†56K	4Ω	2.5Ω	220Ω	500K	†2700Ω	†475Ω
V7	3DT6	5.3Ω	560Ω	2.5Ω	1.6Ω	†270K	†3200Ω	560K		
V8	6CM7	*4500Ω	NC	0Ω	10Ω	11Ω	*1.8Meg	400K	2.2Meg	2500Ω
V9	12DQ6	NC	11Ω	TP	†8200Ω	120K	NC	14Ω	0Ω	TOP CAP *17Ω
V10	12AX4GTA	NC	NC	800K	NC	†53Ω	NC	41Ω	42Ω	
V11	1X2B		PINS	1 THRU 8	HAVE	INFINITE	RESISTANCE			TOP CAP *272Ω
V12	21ALP4A	0Ω	1800Ω	Pin 6 †53Ω	Pin 10 †53Ω	Pin 11 †130K	Pin 12 1.6Ω			

† MEASURED FROM OUTPUT OF M1.
* MEASURED FROM PIN 3 OF V10.
NC NO CONNECTION
TP TIE POINT



TUBE PLACEMENT CHART

SET 356 FOLDER 12



PROPERTY OF
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3924 MEADE ST.,
DENVER, COLORADO

CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	RF Amp.	3DC5	
V2	Mixer-Osc.	3S8	
V3	1st Video IF Amp. - Sync. Amp.	5AN8	
V4	2nd Video IF Amp. - Horiz. Osc.	5U8	
V5	Video Output-Sync Sep.	6AW8	
V6	Sound IF Amp. - Audio Output	6AW8	
V7	Audio Detector	3DT6	
V8	Vert. Osc.- Vert. Output	6CM7	
V9	Horiz. Output	12BQ6	
V10	Damper	12AX8GTA	
V11	HV Rectifier	1X2B	

PICTURE TUBE

ITEM No	REPLACEMENT DATA				NOTES
	SONORA PART No.	RS GENERAL ELECTRIC	SYLVANIA PART No.		
V12	21ALP4A, B	21ALP4A ① 21ALP4B ①	21ALP4A ① 21ALP4B ①	Aluminized Silver Screen "RS"	
		21ALP4 ②	21ALP4 ②		

ELECTROLYTIC CAPACITORS

ITEM No	RATING CAP	RATING VOLT	REPLACEMENT DATA SONORA PART No.	AEROVOX PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	200	150	R-3130	PRS-200	ETC3S2	WB342	TD-200-150	S-200	TVA-1423
C2	140	300	R-3133	PRI-100	E100400	WB437		S-300	TVA-1575
C3A	100	300	R-3137	PRJ-047	DQG40			C-T-535	R3340*
B	60	350			BR8305			S-100	
C	400	50							
C4	10	300	R-3133	PRB350V10	BR1335	TC83	TD-10-350	FM-10J2	TVA-1604

* Non catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING CAP	RATING VOLT	REPLACEMENT DATA SONORA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C5	470	2000	690077	HVD-30-470	DD20-471	V2T47	ED3-470	DC30347	30GA-T47	
C6	470	2000	690077	HVD-30-470	DD20-471	V2T47	ED3-470	DC30347	30GA-T47	
C7	23		690082	BPD-000022	TCZ-22	G024	GP-23	UC-5433	SGA-Q22	
C8	1000		690040	KF-001	MFT-1000				502C-D1	
C9	12		690091	DT-12	TCZ-12	G019	GP-12	UC-5413	SGA-Q12	
C10	5-30		690058							
C11	10		690083	BPD-00001	DD-100	G018	GP-10	UC-541	SGA-Q1	
C12	3-3		690057		MH-3		SU15-D	CT565A		
C13	1000		690087	BPD-001	DD-102	K089	ED-1000	DC531	SGA-D1	
C14	1.3		690034							
C15	1000		690059	BPD-001	DD-102	K089	ED-1000	DC531	SGA-D1	
C16	1000		690059	BPD-001	DD-102	K089	ED-1000	DC531	SGA-D1	
C17	33		690091	BPD-000033	TCZ-33	G039	GP-33	UC-5433	SGA-Q33	
C18	5-3		690027		829-3		SU15-D	CT565A		
C19	1		690031	NP0-S1L 5	TCZ-1R5			ET-5151		
C20	12		690091							
C21	4		690010							
C22	1000		690059	BPD-001	DD-102	K089	ED-1000	DC531	SGA-D1	
C23	1000		690059	BPD-001	DD-102	K089	ED-1000	DC531	SGA-D1	
C24	100		690032		TCZ-100					
C25	1000		690040	KF-001	MFT-1000				502C-D1	
C26	1000		690040	KF-001	MFT-1000				502C-D1	
C27	680			BPD-00068	DD-681	K085	GP-680	UC-5368	SGA-T68	Note 1
C28	680			BPD-00068	DD-681	K085	GP-680	UC-5368	SGA-T68	Note 1
C29	1000		690040	KF-001	MFT-1000				502C-D1	
C30	22	200	R-1465	P268N-22		CUSB222		GEM-2022	37M-P22	
C31	1000		R-1447	BPD-001	DD-102	K089	ED-1000	DC531	SGA-D1	
C32	1000		R-1447	BPD-001	DD-102	K089	ED-1000	DC531	SGA-D1	
C33	1000		R-1447	BPD-001	DD-102	K089	ED-1000	DC531	SGA-D1	
C34	1000		R-1447	BPD-001	DD-102	K089	ED-1000	DC531	SGA-D1	
C35	1000		R-1447	BPD-001	DD-102	K089	ED-1000	DC531	SGA-D1	
C36	1000		R-1447	BPD-001	DD-102	K089	ED-1000	DC531	SGA-D1	
C37	4.7		R-1440	NP0-S1K 7	TCZ-4R7	T207		ET-5547		
C38	.047	200	R-1463	BPD-05	DF-503	CUSB347		GEM-4147	37M-S47	
C39	100		R-8015	BPD-0001	DD-101	TP34	GP-100	UC-581	SGA-T1	
C40	23		R-3049	NP0-S122	TCZ-22	TP24	GP-23			
C41	.1	400	R-1823	P48EN-1	DF-104	CUB4P1		GEM-401	47M-P1	
C42	3		R-1104	NP0-S13	TCZ-3R3			ET-553	TCO-3	
C43	68		R-1436	NP0-S168	TCZ-68	TZ26	GP-68		SGA-T68	
C44	47		R-1445	NP0-S147	DD-470	TP28	GP-47	UC-5447	SGA-Q47	
C45	10000		R-9062	BPD-01	DD-103	K093	ED-01	DC531	58K-S1	
C46	8.2		R-1441	NP0-S18.2			TCG-8.2			
C47	1000		R-1447	BPD-001	DD-103	K089	ED-1000	DC531	58K-D1	
C48	18		R-2177		TCZ-18	TZ13	TCO-18			
C49	10000		R-9062	BPD-01	DD-103	K093	ED-01	DC531	58K-S1	
C50	1000		R-9072	BPD-005	DD-502	K080	ED-005	DC535	58K-D5	
C51	10000		R-9062	BPD-01	DD-103	K093	ED-01	DC531	58K-S1	
C52	10000		R-9062	BPD-01	DD-103	K093	ED-01	DC531	58K-S1	
C53	.047	200	R-1463	BPD-05	DF-503	CUSB347		GEM-4147	37M-S47	
C54	.01	600	R-1450	BPD-01	D6-103	CUSB61		GEM-611	37M-S1	
C55	.22	600	R-1468	P68N-22		CUSB722		GEM-6222	47M-P22	
C56	.1	600	R-1798	P68N-1	DF-104	CUB6P1		GEM-601	47M-P1	
C57	.1	400	R-1823	P48N-1	DF-104	CUB4P1		GEM-401	47M-P1	
C58	1000		R-1447	BPD-001	DD-102	K089	ED-1000	DC531	58K-D1	
C59	1000		R-1447	D1-1000	DD-102	K089	ED-1000	DC531	58K-D1	
C60	270	500	R-1439	CM35-431		SWT371		MCE-241	1FM-327	
C61	.022	400	R-1481	BPD-021	DF-303	CUB4S22		GEM-4223	47M-S22	
C62	.5	200	R-1485	P28EN-5		CUB4P5		GEM-205	27M-P5	
C63	.01	600	R-1450	BPD-01	D6-103	CUB61		GEM-611	47M-S1	
C64	680	500	R-3142			SWT68			1FM-368	
C65	.22	600	R-2188	P68N-22		CUB6P22		GEM-6222	47M-P22	
C66	5600		R-8272	BPD-005	DD-503	K080	ED-005	DC535	58K-D5	
C67	.047	400	R-1483	BPD-05	DF-503	CUB4S47		GEM-4147	47M-S47	
C68	.22	600	R-2188	P68N-22		CUB6P22		GEM-6222	47M-P22	
C69	.0047	600	R-2206	BPD-0047	DD-472	CUB6D47		GEM-6247	47M-D47	
C70	.1	200	R-1351	P28N-1		CUB2P1		GEM-201	27M-P1	
C71	1000		R-1447	BPD-001	DD-102	K089	ED-1000	DC531	58K-S1	
C72	1000		R-1447	BPD-001	DD-102	K089	ED-1000	DC531	58K-S1	
C73	1000		R-1447	BPD-001	DD-102	K089	ED-1000	DC531	58K-S1	
C74	1000		R-1447	BPD-001	DD-102	K089	ED-1000	DC531	58K-S1	
C75	1000		R-1450	BPD-01	D6-103	CUB61		GEM-611	37M-S1	
C76	.01	600	R-1450	BPD-01	D6-103	K069	ED-001	DC531	58K-S1	
C77	1000		R-1447	BPD-001	DD-102	K089	ED-1000	DC531	58K-S1	

Note 1: Some versions may use a 1000MMF capacitor in this application. (Part #60040).

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SONORA PART No	CENTRALAB PART No	CLAROSTAT PART No	IRC PART No	MALLORY PART No	INSTALLATION NOTES
R1A	1000Ω		R-3423					Contrast - Note 1
B	500K							Volume - Note 1
C	Switch							
R1A	1000Ω		R-3050	AB-105		Q17-106	U3	Contrast - Note 3
	Shaft			AK-7		Not Req.	Not Req.	
B	500K		R-3049	B-80	A47-500K-Z	Q13-133	U48	Volume - Note 2
	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			KH-1	SWR-12	TR-1	UB-24	
R2A	100K		R-1453	AB-40	A47-100K-B	Q11-138	PTA15L	Bright
B	Shaft			AK-19	RN-3	TQ	Not Req.	
R3A	100K		R-3051	AB-40	A47-100K-S	Q11-138	PTA15L	Bright - Note 3
B	Shaft			AK-19	RN-3	TQ		
R5A	500K		R-3413	AB-59	A47-500K-S	Q11-133	PTA85L	Vert. Hold
B	Shaft			AK-19	RN-3	TQ	Not Req.	
R3A	500K		R-3048	AB-59	A47-500K-S	Q11-133	PTA85L	Vert. Hold - Note 3
B	Shaft			AK-19	RN-3	TQ	Not Req.	
R4A	3Meg		R-1413	AB-84	A47-3Meg-S	Q11-140	25E1	Height
B	Shaft			AK-19	RN-3	TQ	Not Req.	
R4A	3Meg		R-3047	AB-87	A47-3Meg-S	Q11-141	PTA86L	Height - Note 3
B	Shaft			AK-19	RN-3	TQ	Not Req.	
R6	5000Ω	3	R-3046		3S-5000			Vert. Lin. - (Wire-wound)

Note 1: Some versions use single controls in this application.
Note 3: Alternate part used in some versions.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA SONORA PART No.	IRC PART No.	NOTES
R6	470K			BTS-470K	
R7	470K			BTS-470K	
R8	10K			BTS-10K	
R9	2200Ω			BTS-2200	
R10	3300Ω			BTS-3300	
R11	1000Ω			BTS-1000	
R12	4700Ω			BTS-4700	
R13	220K			BTS-220K	
R14	1000Ω			BTS-1000	
R15	3300Ω			BTS-3300	
R16	10K			BTS-10K	
R17	10K			BTS-10K	
R18	150Ω		N-1360	BTS-150	
R19	47Ω		N-7787	BTS-47	
R20	470Ω		N-8011	BTS-470	
R21	180Ω		N-4087	BTS-180	
R22	6800Ω		N-4630	BTS-6800	
R23	1Meg		N-1263	BTS-1Meg	
R24	3.9Meg		N-5473	BTS-3.9Meg	
R25	1Meg		N-1262	BTS-1Meg	
R26	5300		N-5857	BTS-5K	
R27	47000Ω	2	N-7018	BTS-4700	
R28	100K		N-1778	BTS-100K	
R29	56K		N-4623	BTS-56K	
R30	56K	1	N-4623	BTS-56K	
R31	560K		N-7790	BTS-560K	
R32	270K		N-7004	BTS-270K	
R33	470Ω		N-8011	BTS-470	
R34	580Ω		N-4280	BTS-580	
R35	220Ω		N-4024	BTS-220	
R36	390K		N-8026	BTS-390K	
R37	22K		N-8012	BTS-22K	
R38	560K		N-7790	BTS-560K	
R39	4700Ω		N-4715	BTS-4700	
R40	4700Ω		N-4578	BTS-4700	
R41	390K		N-8026	BTS-390K	
R42	470K		N-4037	BTS-470K	
R43	1800Ω		N-4281	BTS-1800	
R44	3300Ω		N-8718	BTS-3300	
R45	2.2Meg		N-4377	BTS-2.2Meg	
R46	820Ω	1	N-3018	BTA-820	
R47	2700Ω	2	N-7156	BTS-2700	
R48	6800Ω		N-1454		
R49	680Ω		N-1454		
R50	22K		N-8012		
R51	120K		N-3009		
R52	47K		N-7124		
R53	100K		N-2973		
R54	10K		N-4895		
R55	56K		N-4623		
R56	180K		N-7003		
R57	56K		N-4623		
R58	120K		N-3009		
R59	470		N-7787		
R60	8200Ω	2	N-7411	BTS-8200	
R61	5600Ω	1	N-7400	BTS-5600	
R62	150K	1	N-9017		
R63	150K	1	N-9017		
R64	150K	1	N-9017		
R65	2.2Ω		N-7178	BW-2.2	
R66	27Ω	10	R-2125	PW10-25	
R67	27Ω	10	R-2125	PW10-25	
R68	27Ω	10	R-2125	PW10-25	
R69	2700Ω	10	R-3124	PW10-2500	
R70	5.6Ω	5	R-8409	FR5.6	
R71	220K		N-4026	BTS-220K	

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA SONORA PART No	Halldorson PART No	Merit PART No	RCA TYPE No	Ram PART No	Stancor PART No	Thordorson PART No	Triad PART No
T1	Vert. Osc. Trans.	R-1425	B6702 ②	A-3003 ②	209T1 ②	V40S ②	A-8125 ②	28A03 ②	A-07X ②
T2	Horiz. Output Trans.	R-8100 ① R-2057-1 R-3057 ①	FB448M* ③	BVO-58* ③	X126* ③	HO-250* ③	FLY-80* ③	D-83* ③	
T3	Vert. Output Trans.	R-3058	21S08 ②	A-3039 ②	226T1 ②	V31S ②	A-8141 ②	28H54 ②	A-104X ②
T4A	Yoke(90°)Horiz(13.5MH	R-3080	DP8071 ③	MDF-92 ③	216D1 ③	TW21A/43 ③	DY-18A ③	Y-16 ③	Y-41-1 ③
B	Vert(42MH)								

① Alternate part number.
② Drill new mounting hole(s).
③ Use original mounting screws, and trim term board to duplicate original.
* Use original yoke damping network if necessary.
‡ This part may be superceded by Parts Manufacturer's introduction of special unit for this application.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type is Listed

ORIGINAL TERMINAL (CONNECTIONS)	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordorson Replacement Connections	Triad Replacement Connections
8	8	8	8	8	8	8	8
7	3	6	6	3	6	3	7
6	N.C. See Note ②	N.C. See Note ②	3	N.C. See Note ②	N.C. See Note ②	N.C. See Note ②	N.C. See Note ②
5	N.C. See Note ②	N.C. See Note ②	N.C. See Note ②	N.C. See Note ②	N.C. See Note ②	N.C. See Note ②	N.C. See Note ②
2	2	2	2	2	2	2	2
Special Note:	② ③	② ③	② ③	② ③	② ③	② ③	② ③

② To provide horiz. yoke damping, connect approx. 50-100MMFD 2KV in series with resistor (R84) across horiz. yoke terms #3 and #7.
③ Remove capacitor (C69) from circuit, and to insure sufficient width, connect approx. 100MMFD 4KV across horiz. yoke terms #3 and #1.

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE PRI	IMPEDANCE SEC	REPLACEMENT DATA SONORA PART No.	Halldorson PART No	Merit PART No	Stancor PART No	Thordorson PART No	Triad PART No	NOTES
T5	13.5K	3-4Ω	R-2059	21U18	A-3934	A-3881	26S47 ①		① Drill one new mtg. hole.

SPEAKER

ITEM No.	TYPE SIZE	FIELD	V C	IMP	REPLACEMENT DATA SONORA PART No	QUAM PART No	NOTES
SP1	4"	PM		3-4Ω	R-1526	4A07	

COILS (RF-IF)

ITEM No.	USE	SONORA PART No.	NOTES
L1	Ant. Trans.	346107	Note 1
L2	41MC Trap	343095	
L3	FM Trap	343130	
L4	Ant. Coils	135790	Complete Ass'y.
L5	Ant. Coil	343107	Channel 13
L6	PIL Choke	343095	
L7	RF Coils	135791	Complete Ass'y.

Note 1: Complete assembly part #135792. Includes R6, R7, C3, C8 and L1.

ITEM No.	USE	SONORA PART No.	MESSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L15	1st Video IF	R-3063		TV-131	6325	
L16	RF Choke	R-1431	19-8338e		4624-m	38 Microhenries; Wound on 47Ω Ω resistor.
L17	2nd Video IF	R-3054				
L18	3rd Video IF	R-3055				
L19	Series Peaking Coil	R-1470	19-3093	TV-131	6177	88 Microhenries
L20	Series Peaking Coil	R-1060		TV-130-a	6134-a	255 Microhenries; Wound on 12K resistor.
L21	4.5MC Trap	N-5011	20-1004	TV-131	1469	
L22	Shunt Peaking Coil	R-1949			4053-m	1309 Microhenries; Wound on 47000 Ω resistor.
L23	1st Sound IF	R-1635	20-1004	TV-131	1469	
L24	2nd Sound IF	R-1160				
L25	Quadrature Coil	R-1159	20-1005		1470	

* Parallel with 47000 resistor.
▲ Parallel with 12K resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES PRI.	DC RES SEC.	REPLACEMENT DATA SONORA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No	Ram PART No	Thordorson PART No	NOTES
L26	75Ω		R-1606							Tap @ 53Ω Horiz. Osc. Horiz. Waveform
L27	45Ω		R-1605							

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE @ CURRENT 1000 (%)	REPLACEMENT DATA SONORA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordorson PART No.	Triad PART No.
L28	.150A	57Ω	4.94H	R-3055	C9041 ①	C-2956 ①	C-2328 ①	28C44 ①	C-23X ①

① Drill one new mounting hole.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SONORA PART No	REPLACEMENT DATA
K1	Sync Circuit	100K, 330K, 2.2Meg, 270MMF, 1000MMF, 25MMF	R-1469	Aerovox PRS31 Centralab PC-280 Sprague RT-1
K2	Vert. Integrator	33K, 10K, 4700MMF, 470MMF	R-1458	Aerovox PA-383-2 Centralab PC-106 Sprague V-5

SELENIUM RECTIFIER

ITEM No	RATING CURRENT	REPLACEMENT DATA SONORA PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	NOTES
M1	.125A	R-1147	1038A	6RS250	S250	5Q	250A	
M2	.125A	R-1147	1038A	6RS250	S250	5Q	250A	

SELENIUM DIODE

ITEM No	RATING CURRENT	REPLACEMENT DATA SONORA PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	NOTES
M3		R-1141		1T1				Horiz. Phase Det. (Pigtail)

CRYSTAL DIODES

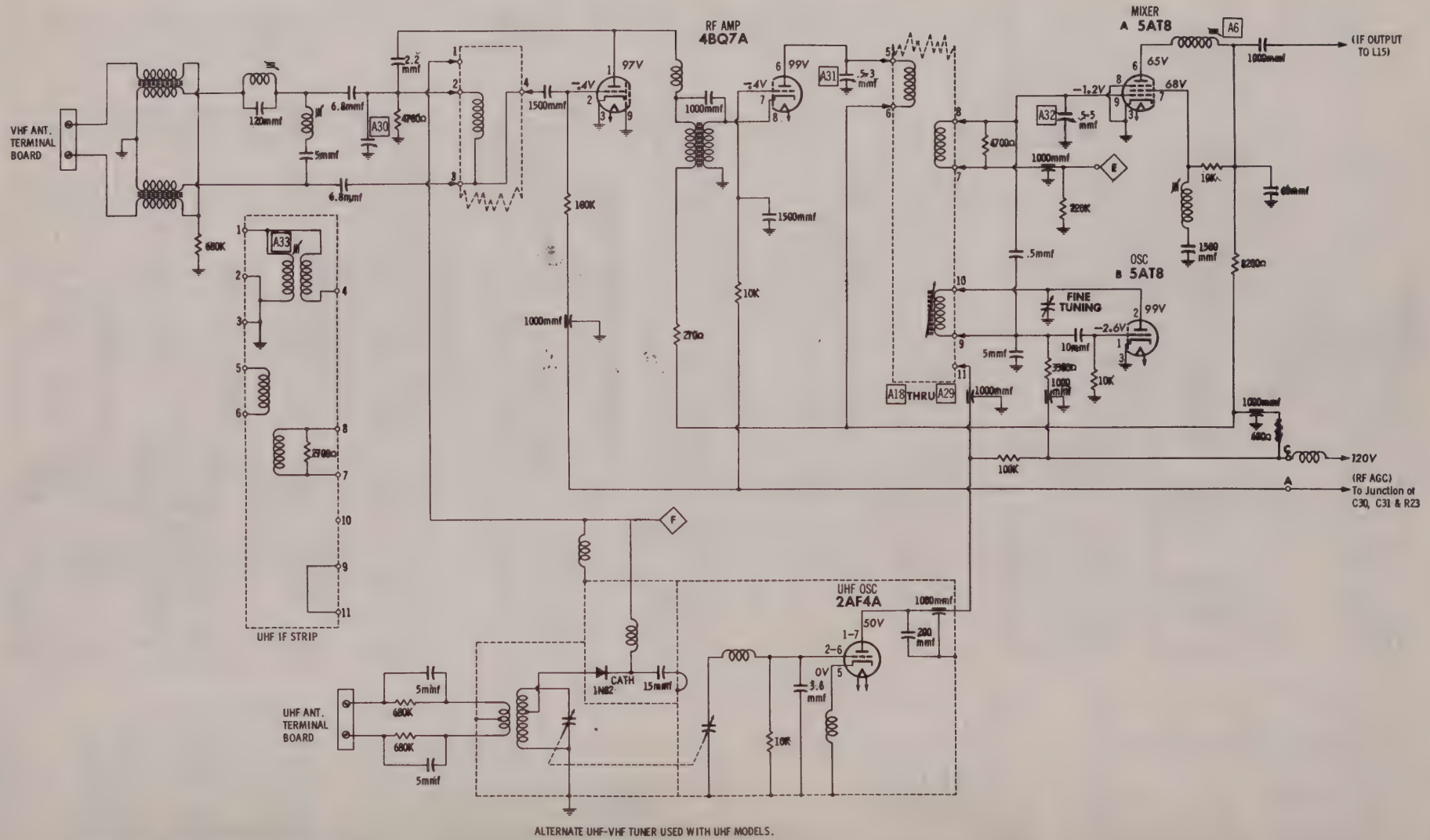
ITEM No	ORIG. TYPE	REPLACEMENT DATA SONORA PART No.	SYLVANIA PART No.	NOTES
M4	1N60	1N60	1N60	Video Detector (Pigtail)

① 1N54 may be used in some versions.

MISCELLANEOUS

ITEM No.	PART NAME	SONORA PART No.	NOTES
M5	Tuner	R-3409	VHF
M6	Centering Device	R-3043	
M7	Ion Trap	R-3044	

SONORA
MODELS 606, 615



A PHOTOFACT STANDARD NOTATION SCHEMATIC
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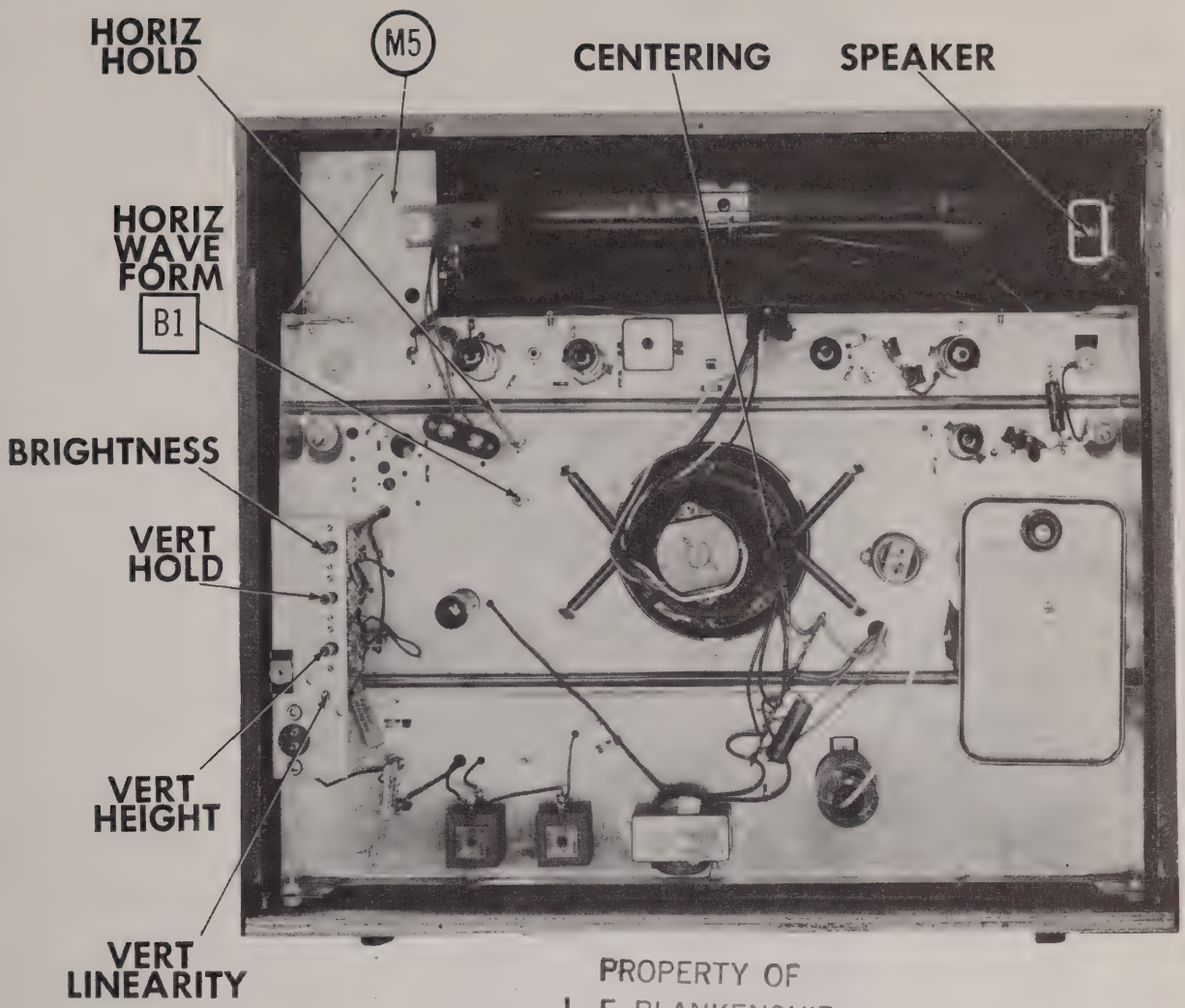
ALTERNATE UHF-VHF TUNER SCHEMATIC



PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

1. Turn the set on and tune in a TV signal, preferably with a test pattern. Adjust the contrast for a normal picture. Adjust the horizontal hold until the picture synchronizes horizontally.
2. Connect the vertical amplifier of the scope to point Ⓓ thru a low capacity probe. Connect the low side to chassis. Adjust the horiz. waveform slug (B1) until a waveform similar to Fig. 6 is obtained. Make sure the round peak is no more than 10% below the sharp peak or double triggering may result. During adjustment of B1 keep the picture in sync with the horizontal hold.
3. Adjust the horizontal hold to the point that the picture remains in sync when the tuner is switched off channel and back again.

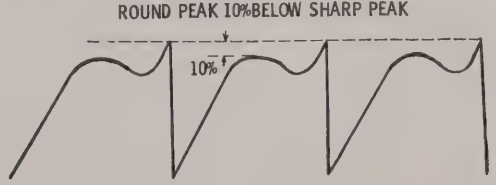


FIG. 6

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.,
DENVER, COLORADO

SPARTAN CHASSIS
AMP-151AA, BB

SPARTAN CHASSIS
AMP-151AA, BB

TRADE NAME	Spartan Chassis AMP-151AA, AMP-151BB
MANUFACTURER	Spartan Div. The Magnavox Co., Fort Wayne 4, Indiana
TYPE SET	AC Operated 6 Watt Audio Amplifier
TUBES (Four)	Types 12AX7 AF Amp. -Phase Inv., (2) 6AQ5 Output, 6X5GT Rectifier
POWER SUPPLY	110-120 Volts AC - 50/60 Cycles RATING .37 Amp. @ 117 Volts AC

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PARTS LIST AND DESCRIPTIONS

SPARTAN
CHASSIS AMP-151AA

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amp. -Phase Inverter	12AX7	
V2	Output	6AQ5	
V3	Output	6AQ5	
V4	Rectifier	6X5GT	Note 1

Note 1. Type 5Y3GT used in "BB" versions

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA SPARTAN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲40	300	270021-61	AFH4-01-80	D0440	FP419. 86	TMQ-56	Q-210	TVL-4621
B	■20	300							
C	▲10	300							
D	10	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA SPARTAN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	.1	200	250202-13	P288N-1	DF-104	CUB2P1		PT401	2TM-P1	
C3	10000		250218-19	BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	
C4	10000		250218-19	BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	
C5	.047	200	250202-11	BPD-05	DF-503	CUB2S47		PT4147	2TM-S47	
C6	1.0	100	250172-9	P288N-1.0		CUB2W1		PT41	2TM-M1	
C7	10000	1000	250219-2	P1088N-01	DD-103	CUB16S1		PT1611	10HK-S1	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA SPARTAN PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R1	470Ω		230104-58	BTS-470	
R2	10K		230104-74	BTS-10K	
R3	150K		230104-88	BTS-150K	
R4	470K		230104-94	BTS-470K	
R5	6800Ω		230104-72	BTS-6800	
R6	22K		230104-78	BTS-22K	
R7	470K		230104-94	BTS-470K	
R8	470K		230104-94	BTS-470K	
R9	470K		230104-94	BTS-470K	
R10	220Ω	2	230096-54	BTB-220	
R11	1500Ω		230104-64	BTS-1500	Note 1
R12	22K		230104-78	BTS-22K	

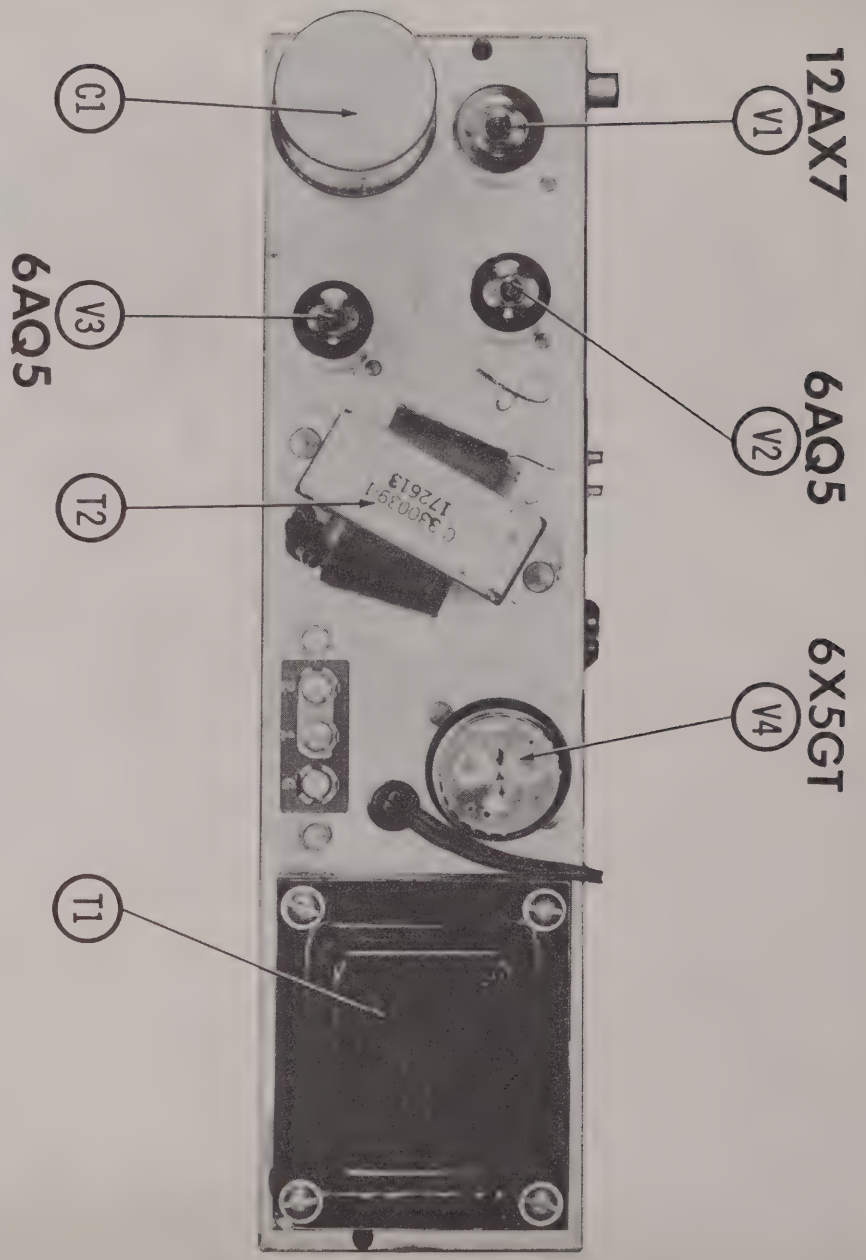
Note 1. 2 Watt resistor used in "BB" versions

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA SPARTAN PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @ .37A	475VCT @ .064A	6.3Vac @ 1.8A		300088-1 ①	P9205 ③	P-3048	PM8419		R-8B ③
					300095-1 ②	P9205	P-3051	PM8403 ④		R-8B

① Used in "AA" versions
② Used in "BB" versions
③ Tape 5V, 2A winding
④ Tape center tap of 6.3V winding

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	SPARTAN PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	7200Ω	3-4Ω	330039-1	Z1009	A-2901	A-3852	24S61	S-53X	

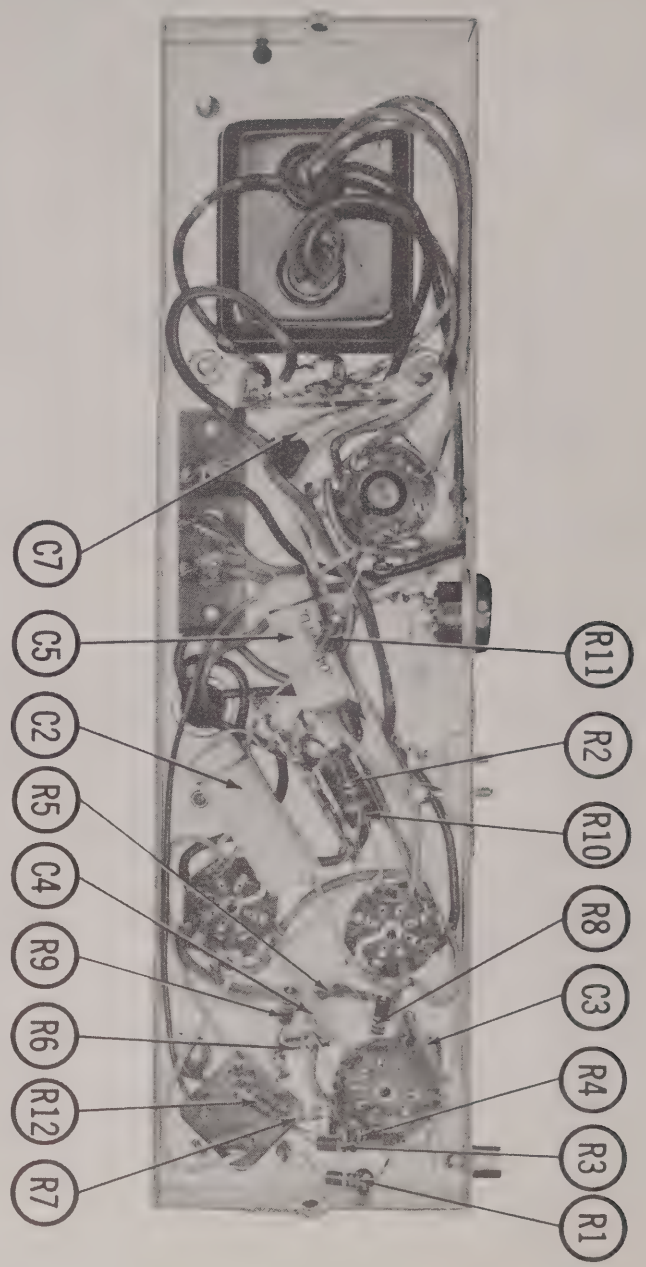
SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	SPARTAN PART No.	QUAM PART No.		
SP1			6Ω	583760-1			
SP2			6Ω	583760-1			
SP3	5"	PM	3.2Ω	580038-1	5A15TZ3.2		

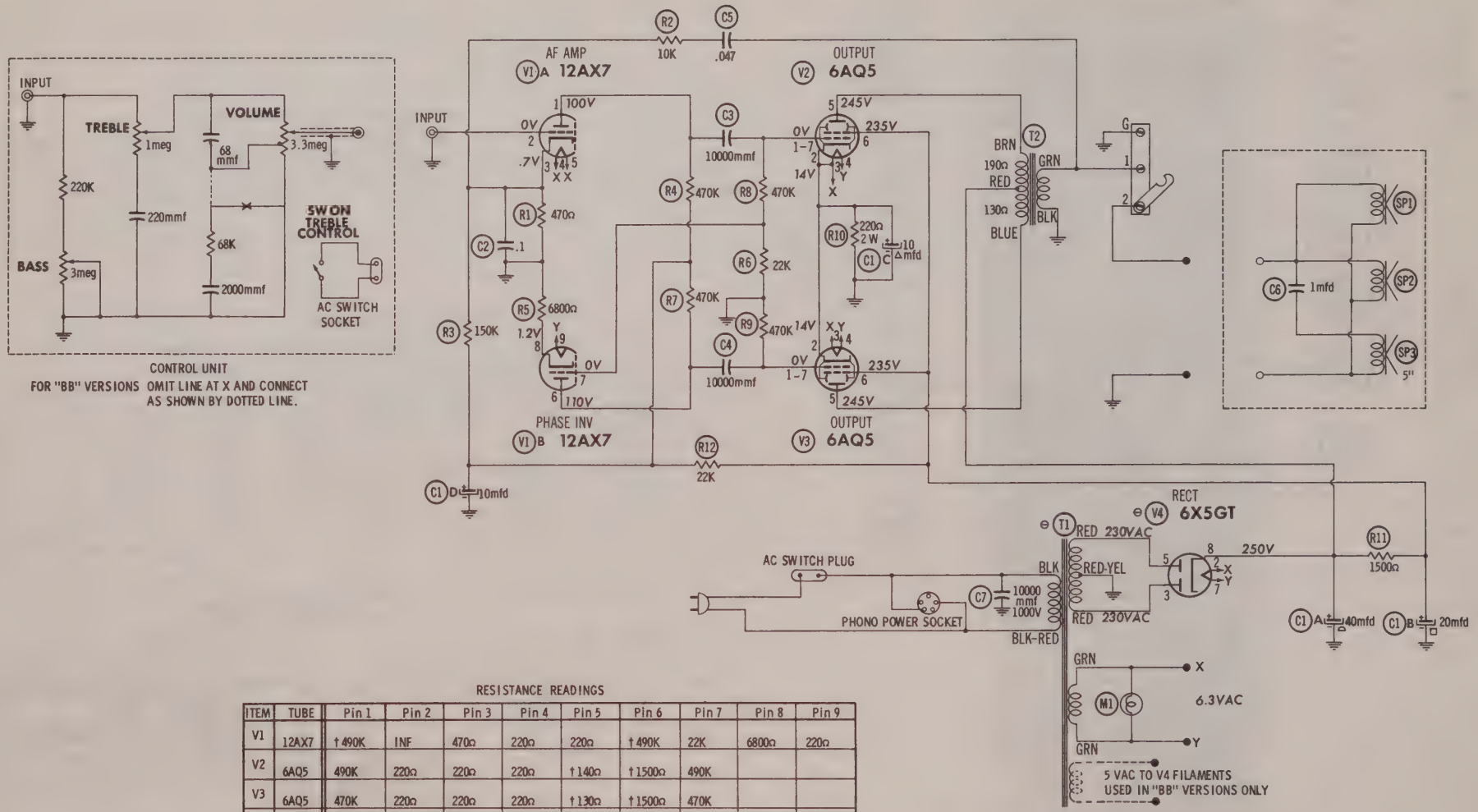
MISCELLANEOUS

ITEM No.	PART NAME	SPARTAN PART No.	NOTES
M1	Pilot Light		

CHASSIS—BOTTOM VIEW



SPARTAN
CHASSIS AMP-151AA



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†490K	INF	470Ω	220Ω	220Ω	†490K	22K	6800Ω	220Ω
V2	6AQ5	490K	220Ω	220Ω	220Ω	†140Ω	†1500Ω	490K		
V3	6AQ5	470K	220Ω	220Ω	220Ω	†130Ω	†1500Ω	470K		
V4	6X5GT	NC	220Ω	165Ω	NC	150Ω	NC	220Ω	18K	

† MEASURED FROM PIN 8 OF V4.
NC NO CONNECTION

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

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356-13

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*TRADE MARK

RETMA MEMBER

SPARTAN CHASSIS U21-01AA, U21-02AA, U21-03AA, U21-04AA, V21-02AA, V21-03AA, V21-04AA

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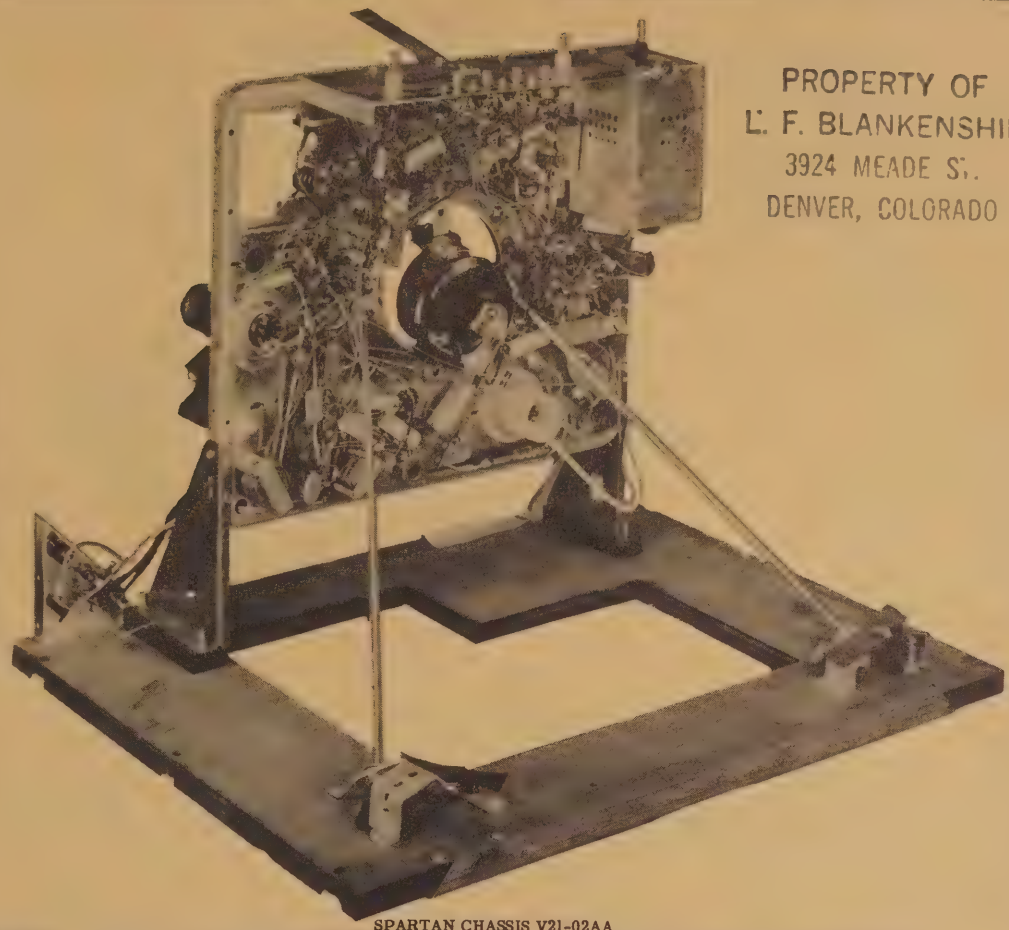

SPARTAN CHASSIS V21-02AA

SPARTAN CHASSIS U21-01AA, U21-02AA, U21-03AA, U21-04AA, V21-01AA, V21-02AA, V21-03AA, V21-04AA

TRADE NAME	Spartan, Chassis U21-01AA, U21-02AA, U21-03AA, U21-04AA, V21-01AA, V21-02AA, V21-03AA, V21-04AA
MANUFACTURER	Spartan Div., The Magnavox Company, Fort Wayne 4, Indiana
TYPE SET	Television Receiver
TUBES	Eighteen
POWER SUPPLY	110-120 Volts AC - 60 Cycles RATING 1.56 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13VHF, 13 thru 83UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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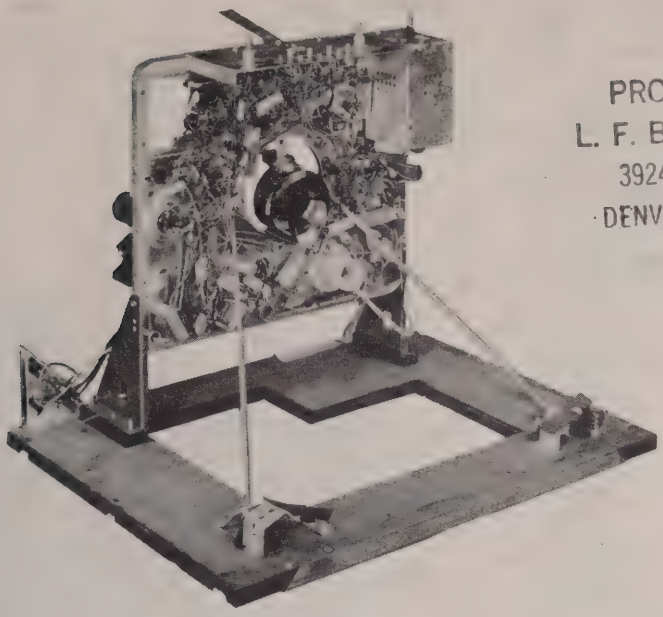

CHASSIS

V21-02AA

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removing the channel selector and fine tuning knobs.

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator it is necessary to remove the rear cover and supply power to the set. Set the horizontal hold control at its mid-range position and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

FOCUS

Focus may be varied by changing jumper on focus board. Adjust ion trap for best focus consistent with maximum brightness.

FUSES

One fuse is used for Horiz. Sweep Circuit protection. (For location see tube placement chart.)

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern. Set the horizontal hold control to its mid-range position.

Turn the horizontal frequency slug (B1) slowly clockwise while switching off and on channel until the picture just loses sync.

Turn B1 counter clockwise until the picture regains sync, then continue $\frac{1}{2}$ turn in the same direction.

The picture should hold sync at both extreme ends of the horizontal hold control rotation.

If necessary, readjust B1 SLIGHTLY and test for sync or pull-in as above.

Adjust the width slug (B2) for a picture SLIGHTLY wider than necessary to fill the picture mask horizontally.

SPARTAN CHASSIS U21-01AA, U21-02AA, U21-03AA, U21-04AA, V21-01AA, V21-02AA, V21-03AA, V21-04AA

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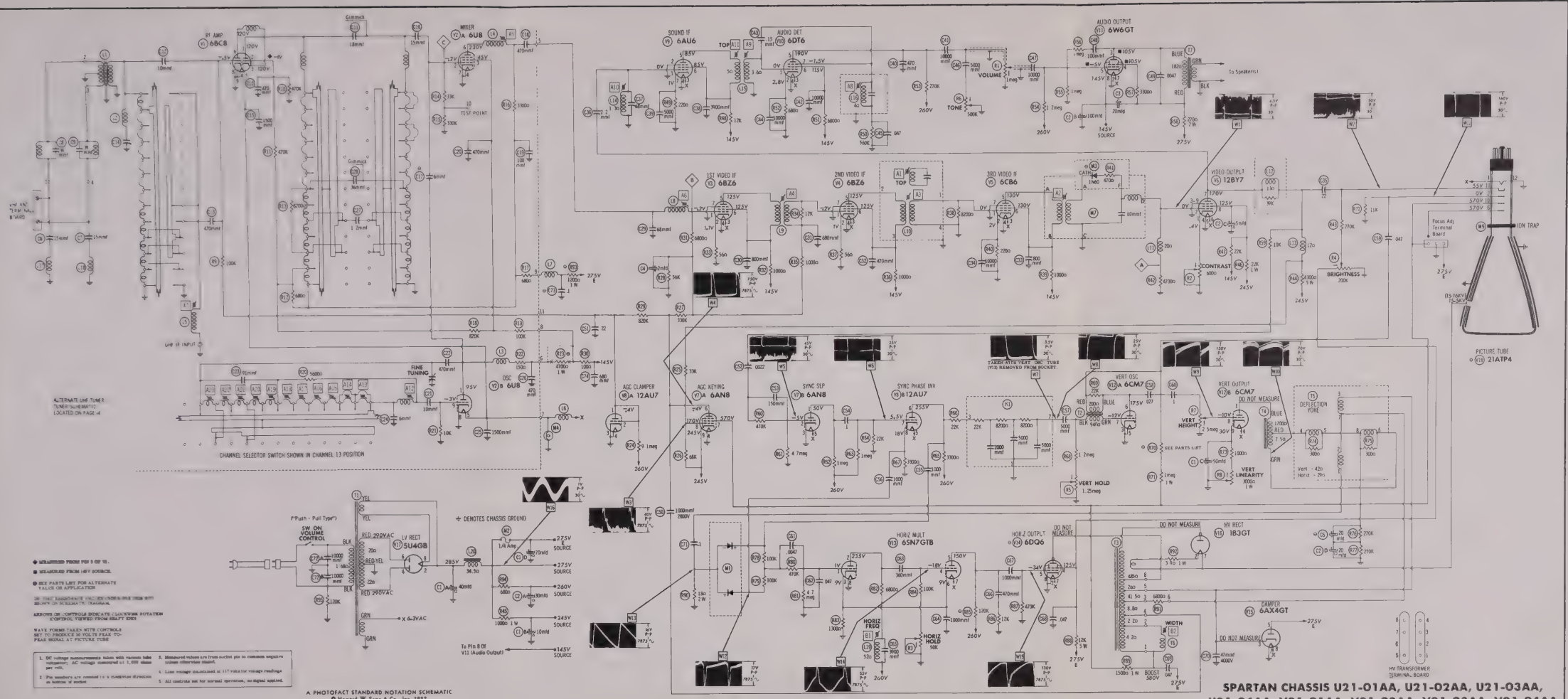
G773R

DATE 5-57 SET 356 FOLDER 14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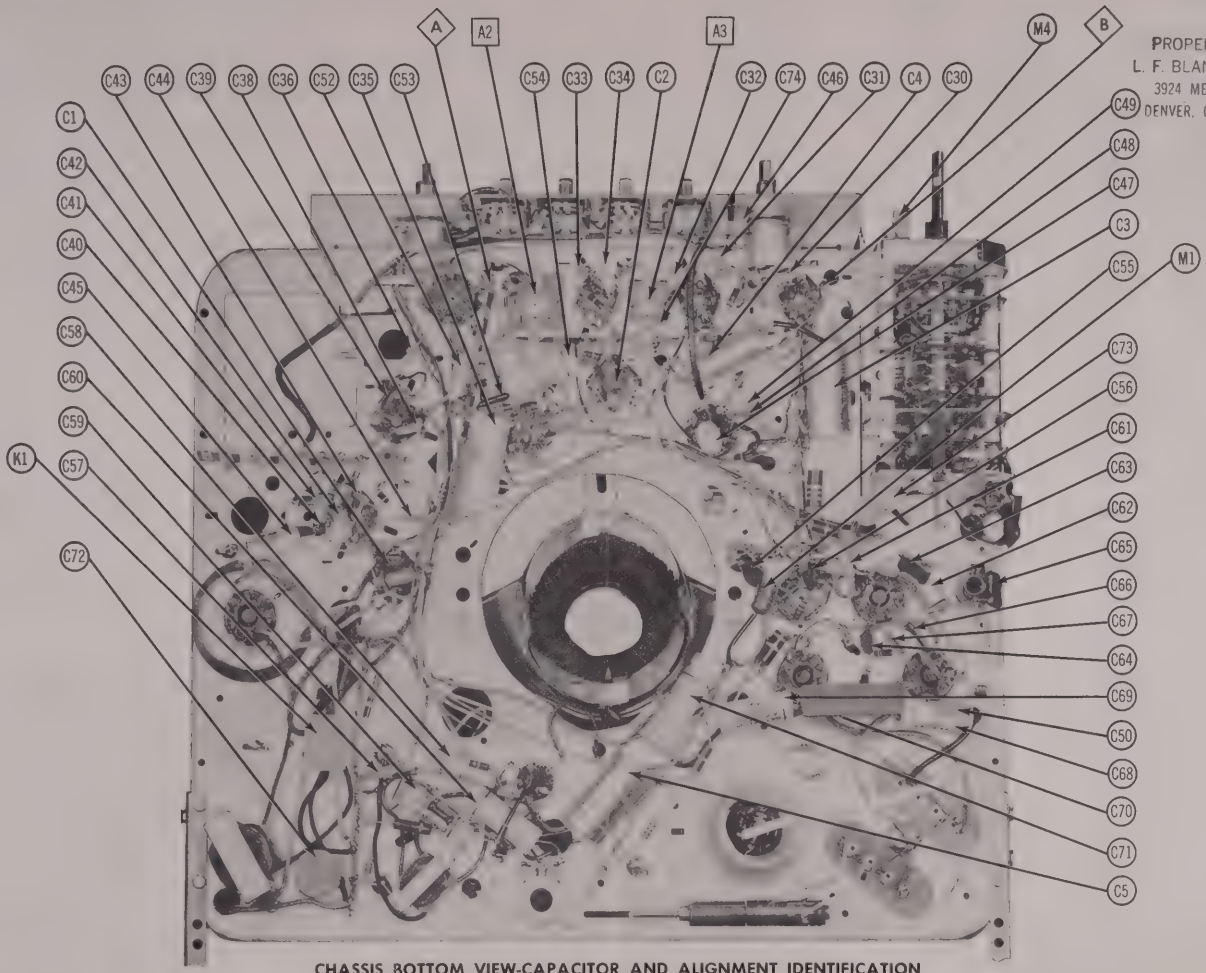
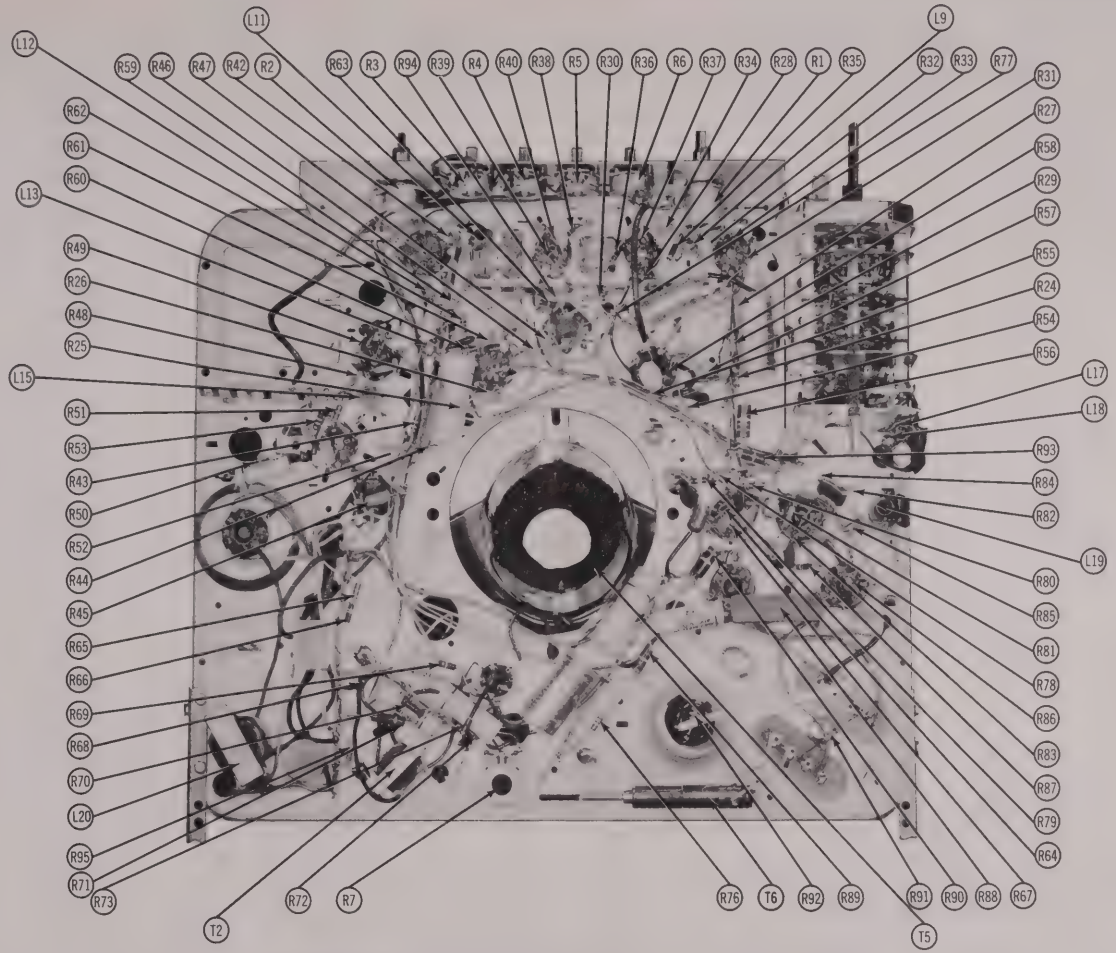


CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

TUBE PLACEMENT CHART

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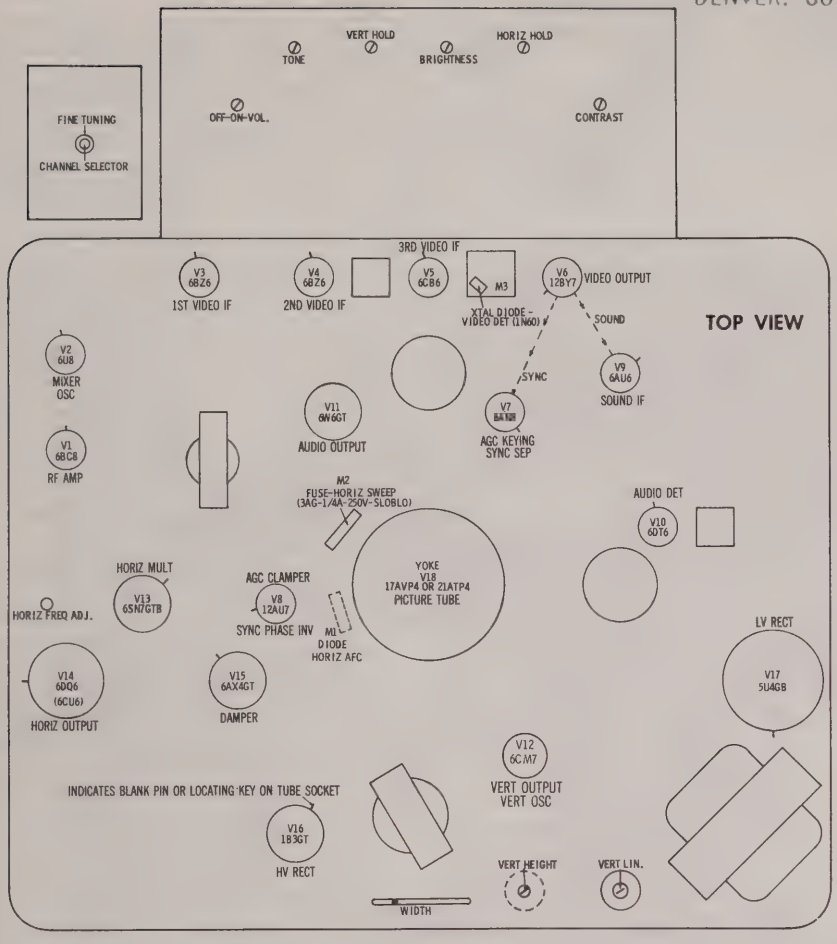


TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V17

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V3, V4, V5, Diode (M3), V6, V18, V11
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V6, V18
Has pic, no sound - V9, V10, V11
Overloaded picture - V7

SYNC FAILURE
No vert. sync - V7, V8, V12
No horiz. sync - V7, V8, Rectifier (M1), V13
No vert. or horiz. sync - V7, V8

SWEEP FAILURE
No raster, has sound - V13, V14, V15, V16, V17, Fuse (M2)
No vertical deflection - V12
Poor vert. linearity or foldover - V12
Poor horiz. linearity or foldover - V13, V14, V15
Narrow picture - V13, V14, V15, V17
Vert. off freq. - V7, V8, V12
Horiz. off freq. - V7, V8, M1, V13

SPARTAN CHASSIS U21-01AA, U21-02AA, U21-03AA, U21-04AA, V21-01AA, V21-02AA, V21-03AA, V21-04AA

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Do not remove the horizontal oscillator tube (V13) to disable the high voltage. The high voltage lead should be securely taped and kept away from the chassis.

VIDEO IF ALIGNMENT

Connect the negative lead of a 1. 5 volt bias battery to the ungrounded side of C51. Connect the negative lead of a 3 volt bias battery to the ungrounded side of C4. Connect both positive leads to chassis. Set the local-distant switch to local position and the contrast control fully counter clockwise. Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	. 001MFD	High side to point Ⓑ. Low side to chassis.	43MC (10MC Swp)	47. 25MC	Any non-interfering channel.	Vert. amp. thru 10K to point Ⓐ. Low side to chassis.	A1	Adjust to place marker in trap notch as in Fig. 1. Use enough sweep generator output so that trap notch is plainly visible on scope. It is possible to obtain two settings of A1. The correct setting is with the core farthest out of the coil form.
2.	"	"	"	42. 75MC 45. 0MC 45. 75MC 47. 25MC	"	"	A2, A3, A4	Adjust A2 for maximum response between 42. 75MC and 45. 75MC. Adjust A3 to place 45. 75MC marker at 45% on response curve. Adjust A4 to place 42. 75MC marker at 60% on response curve. (See Fig. 2) Recheck A1 trap (47. 25MC).
3.	"	High side to point Ⓒ. Low side to chassis.	"	42. 75MC 45. 75MC	"	"	A5, A6	Adjust A5 for maximum gain while placing 45. 75MC marker at 45% on response curve as in Fig. 2. Adjust A6 for maximum gain and overall response with proper tilt. It may be necessary to alternately adjust A5 and A6 several times to obtain response within limits as shown in Fig. 2.
4.	1K resistor	High side to point Ⓓ thru 1K. Low side to chassis.	43MC (10MC Swp)	42. 75MC 45. 0MC 45. 75MC	Any unused UHF channel.	"	A7	Set VHF to UHF position. Adjust A7 for MINIMUM tilt on response curve as in Fig. 2. This adjustment need be made only when UHF-VHF tuner is used in set.

SOUND IF ALIGNMENT

Set contrast control to maximum.
Tune the receiver to a strong local station and adjust for maximum volume and MINIMUM distortion.
Reduce the signal input by disconnecting antenna or placing an attenuator between the antenna and the antenna terminals, so that with the volume control turned to maximum, the sound is barely audible. Adjust A9 for MINIMUM noise and clearest sound.
With the same weak signal input, adjust A10 and A11 for MINIMUM distortion and clearest sound.
Reduce the signal input further until noise is present and retouch A9 for MINIMUM noise and clearest sound.

VHF OSCILLATOR ALIGNMENT

If a separate signal generator is used as a marker generator, loosely couple it to the antenna terminals.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	Fig. 3	Thru matching network (Fig. 3) to antenna terminals.	213MC (10MC Swp)	211. 25MC 215. 75MC	13	Vert. amp. thru 10K to point Ⓐ. Low side to chassis.	A12	Adjust to place sound marker in trap notch as in Fig. 4. Video marker should fall at 50%. See Fig. 5 for adjustments.
			207MC (10MC Swp)	205. 25MC 209. 75MC	12		A13	
			201MC (10MC Swp)	199. 25MC 203. 75MC	11		A14	
			195MC (10MC Swp)	193. 25MC 197. 75MC	10		A15	
			189MC (10MC Swp)	187. 25MC 191. 75MC	9		A16	
			183MC (10MC Swp)	181. 25MC 185. 75MC	8		A17	
			177MC (10MC Swp)	175. 25MC 179. 75MC	7		A18	
			85MC (10MC Swp)	83. 25MC 87. 75MC	6		A19	
			79MC (10MC Swp)	77. 25MC 81. 75MC	5		A20	
			69MC (10MC Swp)	67. 25MC 71. 75MC	4		A21	
			63MC (10MC Swp)	61. 25MC 65. 75MC	3		A22	
			57MC (10MC Swp)	55. 25MC 59. 75MC	2		A23	

RF AND MIXER ALIGNMENT AND UHF TUNER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

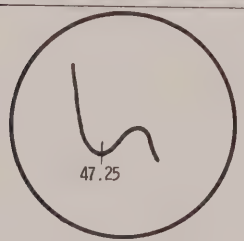


FIG. 1

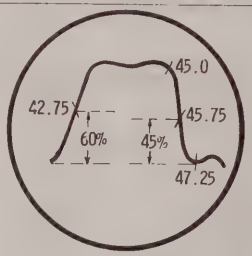


FIG. 2

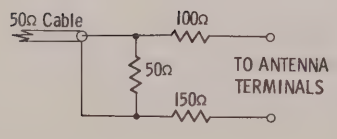


FIG. 3

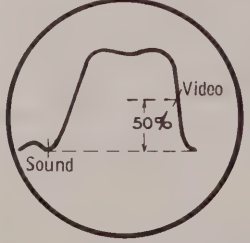
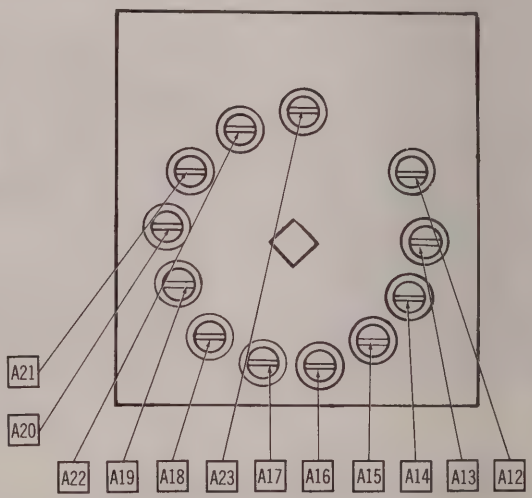
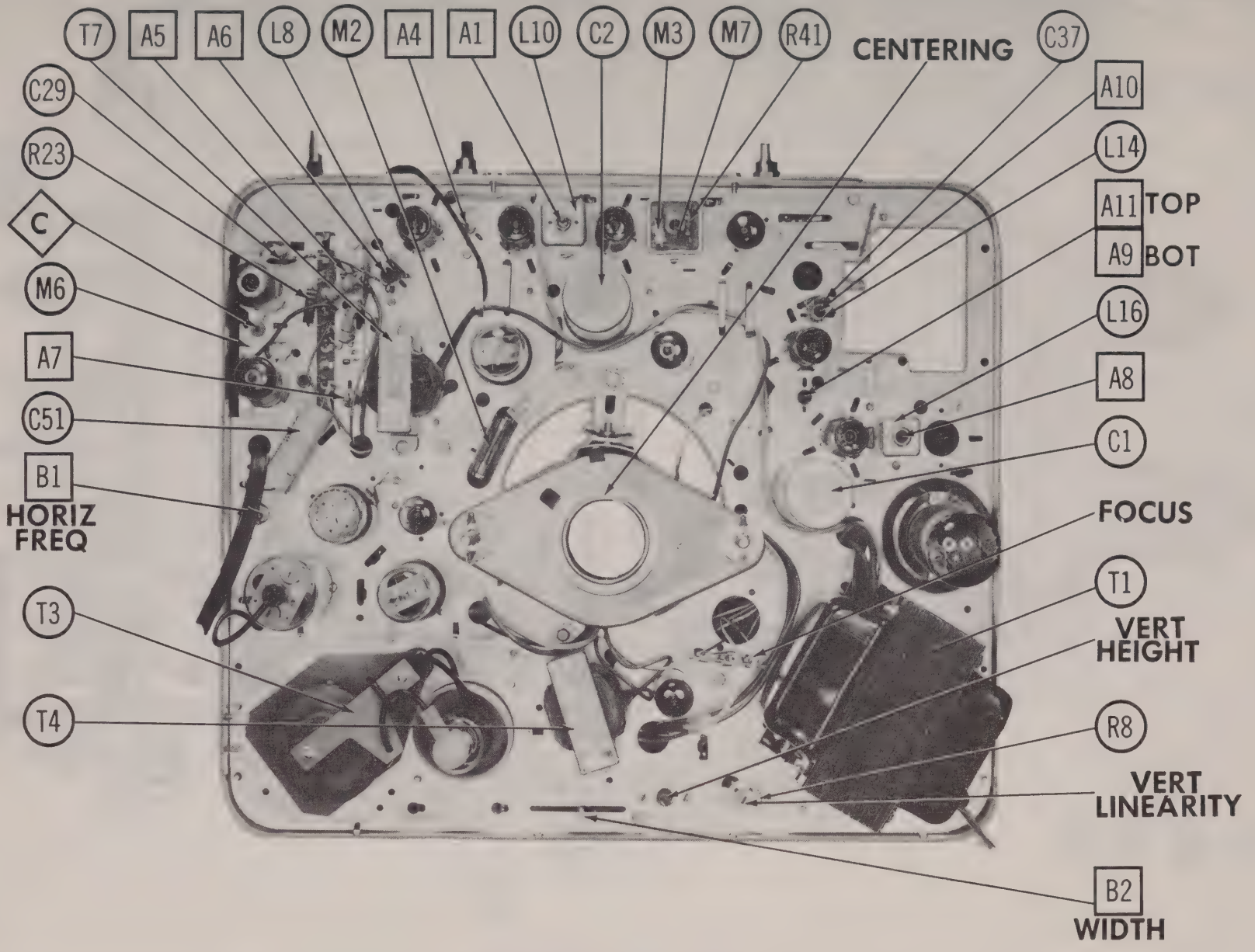


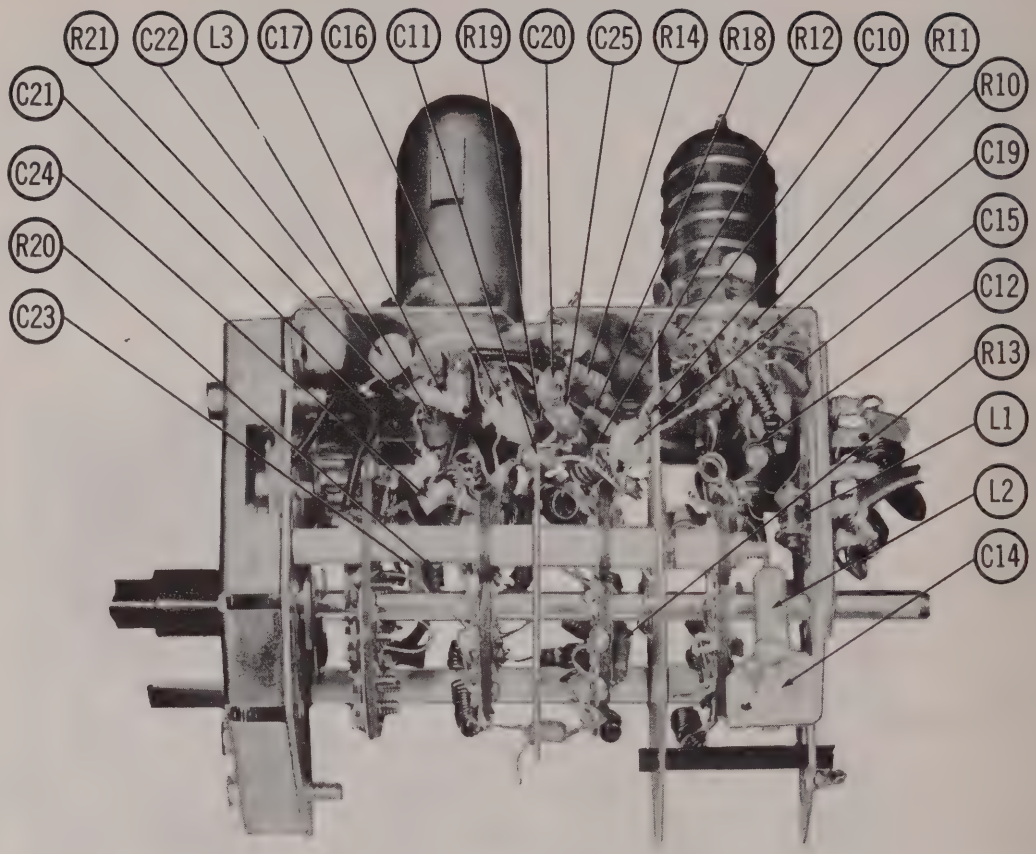
FIG. 4



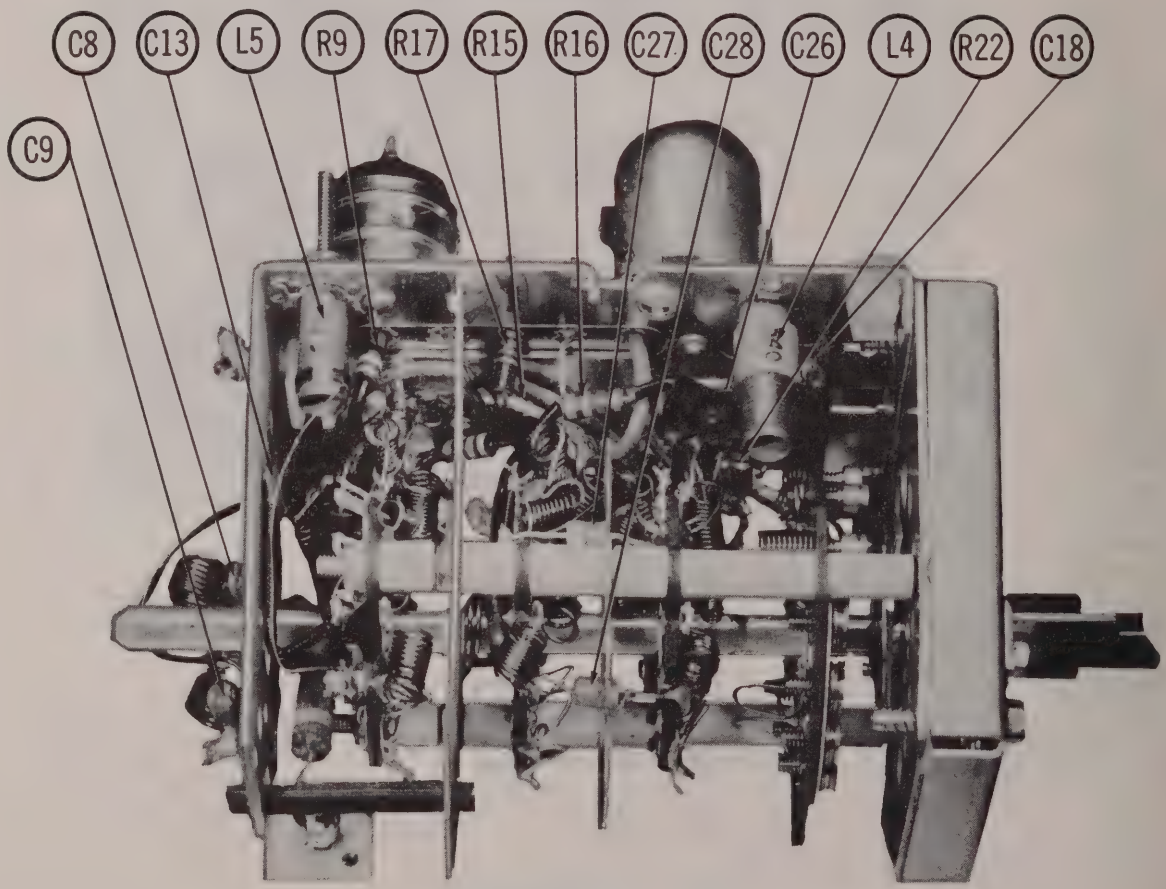


CHASSIS TOP VIEW

SPARTAN CHASSIS U21-01AA, U21-02AA, U21-03AA,
U21-04AA, V21-01AA, V21-02AA, V21-03AA, V21-04AA



RF TUNER-RIGHT SIDE



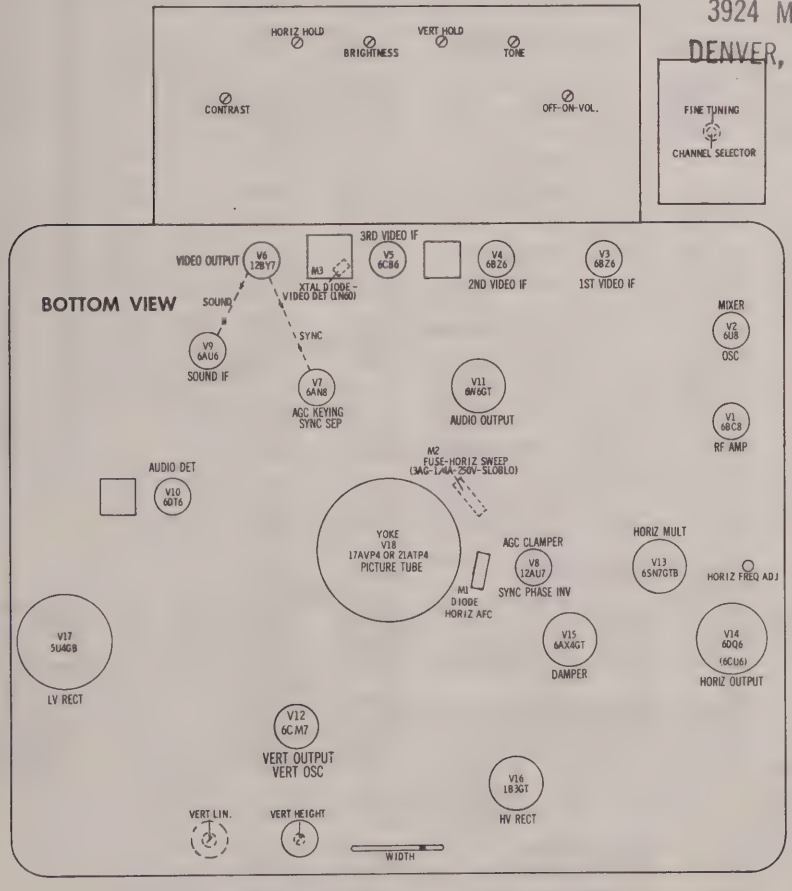
RF TUNER-LEFT SIDE

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BC8	†2000Ω	250K	INF	0Ω	.1Ω	INF	1.1Meg	0Ω	0Ω
V2	6U8	†40K	360K	†100K	0Ω	.1Ω	†5500Ω	0Ω	0Ω	10K
V3	6BZ6	55K	56Ω	.1Ω	0Ω	▪1000Ω	▪1000Ω	0Ω		
V4	6BZ6	50K	56Ω	.1Ω	0Ω	▪1000Ω	▪1000Ω	0Ω		
V5	6CB6	.1Ω	220Ω	.1Ω	0Ω	▪1000Ω	▪1000Ω	0Ω		
V6	12BY7	●130Ω	4700Ω	0Ω	0Ω	0Ω	.1Ω	†5500Ω	▪22K	0Ω
V7	6AN8	†1Meg	4.7Meg	0Ω	0Ω	.1Ω	380K	‡1500Ω	†23K	†1000Ω
V8	12AU7	1Meg	1Meg	0Ω	0Ω	.1Ω	†4000Ω	22K	3300Ω	
V9	6AU6	1.3Ω	0Ω	.1Ω	0Ω	▪12K	▪12K	220Ω		
V10	6DT6	3.6Ω	680Ω	.1Ω	0Ω	†270K	▪6800Ω	560K		
V11	6W6GT	TP	0Ω	†450Ω	†3600Ω	550K	NC	.1Ω	120K	
V12	6CM7	‡3300Ω	NC	0Ω	.1Ω	0Ω	1.8Meg	●1.7Meg	●1Meg	●1500Ω
V13	6SN7GTB	4.7Meg	†7500Ω	1300Ω	●140K	†120K	1300Ω	.1Ω	0Ω	
V14	6DQ6	TP	0Ω	TP	†12K	470K	TP	.1Ω	0Ω	TOP CAP †26Ω
V15	6AX4GT	NC	NC	INF	NC	†35Ω	NC	0Ω	.1Ω	
V16	1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ‡500Ω
V17	5U4GB	NC	120K	NC	22Ω	NC	20Ω	NC	120K	
V18	21ATP4	.1Ω	11K	Pin 6 ‡1500Ω	Pin 10 ‡1500Ω	Pin 11 ●320K	Pin 12 0Ω			

† MEASURED FROM PIN 2 OF V17.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
‡ MEASURED FROM PIN 3 OF V15. NC NO CONNECTION
▪ MEASURED FROM 145V SOURCE. TP TIE POINT

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO



TUBE PLACEMENT CHART

Set 356 Folder 14

SPARTAN CHASSIS U21-01AA, U21-02AA, U21-03AA, U21-04AA, V21-01AA, V21-02AA, V21-03AA, V21-04AA

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	RF Amp.	6BC8	
V2	Mixer, Osc.	6L6	
V3	1st Video IF Amp.	6BZ6	
V4	2nd Video IF Amp.	6BZ6	
V5	3rd Video IF Amp.	6CB6	
V6	Video Output	12BY7	
V7	AGC, Keying, Sync Sep.	6AN8	
V8	AGC Clamper- Sync Phase Inverter	12AU7	

Note . 6CL8 used as alternate

ITEM No	USE	TYPE	NOTES
V9	Sound IF Amp.	6AU6	
V10	Audio Det.	6DT6	
V11	Audio Output	6W6GT	
V12	Vert. Osc. - Vert. Output	6CM7	
V13	Horiz. Mult.	6BN7GTB	
V14	Horiz. Output	6LX6	Note 1
V15	Damper	6AZ8G7	
V16	HV Rectifier	1B3GT	
V17	LV Rectifier	5U4GB	

PICTURE TUBE

ITEM No	REPLACEMENT DATA				
	Spartan PART No.	RCA PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	NOTES
V18	21AUP4	21AUP4 ①	21AUP4	21AUP4-A ②	① Aluminized ② Silver Screen 85
	17AVP4	17AVP4 ①	17AVP4	17AVP4 ②	
		17AVP4A ①	17AVP4A	17AVP4A ②	

ELECTROLYTIC CAPACITORS

ITEM No	RATING		REPLACEMENT DATA						
	CAP	VOLT	Spartan Part No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRANOL PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	40	350	3700S1-83	RE1006		CGS70	FP375 ⑤		Q-310	TVL 4631
B	40	350				CGS05	C1C62		MT-4530	
C	50	50								
D	70	350								
C2A	30	350	3700S1-84	AFH4-56-83			FP419-86		T-735	R2346*
B	100	200					TC80		MTD-4508	
C	5	350								
D	150	350								
C3	20	350	3700S7-30	PR6450V30	BR5035	TC65	TD-30-350		FM-4520	TVA-1508
C4	2	50	3700S7-33	SR6S0V3	SHR3-50	TC202	TD-3-50		FM-4503	TVA-1501
C5	30	350	3700S7-30 (Note 1)	PR6450V30	BR5035	TC65	TD-30-350		FM-4520	TVA-1508

Note 1: In some versions, C5 may be a non polarized unit.
* Non catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	Spartan PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C6	15		3SC307-84							
C7	15		2SC307-84							
C8	39		3SC175-30	NT50-S139	TCN-39	C10Q39U	TC7-39			
C9	39		3SC175-30	NT50-S139	TCN-39	C10Q39U	TC7-39			
C10	470		3SC175-9	BPD-0047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	
C11	18		3SC316-4							
C12	10		3SC221-12T	BPD-0001	DD-100	L10Q1	ED-10	UC-541	5GA-Q1	
C13	470		3SC175-8	BPD-0047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	
C14			2SC198-5							
C15	1500		3SC175-28	BPD-0015	DD-152	BYA10D15	ED-1500	UC-5315	5HK-D15	
C16	15		3SC307-5	BPD-000015	DD-150	L10Q15	ED-15	UC-5415	5GA-Q15	Note 2
C17	6									
C18	470		3SC175-8	BPD-0047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	
C19	100		3SC175-24	BPD-0001	DD-101	L10T1	ED-100	UC-531	5GA-T1	
C20	470		3SC175-8	BPD-0047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	
C21	10		3SC088-126	BPD-00001	DD-100	L10Q1	ED-10	UC-541	5GA-Q1	
C22	470		3SC218-15							
C23	6									
C24	6		2SC068-143							
C25	1500		3SC175-28	BPD-0015	DD-152	BYA10D15	ED-1500	UC-5315	5HK-D15	
C26	470		3SC175-8	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	
C27	1.5		3SC175-3	BPD-SD1.5	DD-1R5		TCD-1			
C28	.36		3SC218-5							
C29	68	300	3SC218-336	NPO-S168	TCS-68	C10Q68C	TCO-68		STCU-Q68	
C30	68		3SC218-44							
C31	680		3SC218-4	D1-680	DD-681	L10T68	ED-680	UC-5368	5GA-T68	
C32	470		3SC218-15	D1-470	DD-471		ED-470			
C33	800		2SC218-14							
C34	10000		3SC175-3	BPD-01	DD-103	BYA10S1M	GP-10000	DC51	5HK-S1	
C35	.33	400	3SC311-15	P488M-33		CU54Y33		GEM-4083	4TM-P33	
C36	3.3		3SC311-18	BPD-3R3.3	TCS-3R3	C10Y33C	TCD-3.3		STCB-Y33	
C37	68		3SC218-7	NT50-S168	TCN-68	C10Q68U	TC7-68		STCU-Q68	
C38	3900		3SC175-31	BPD-004	DD-402	BYA10D4	GP-4000	UC-5240		
C39	5000		3SC175-1	BPD-005	DD-502	BYA10D5	GP-5000	DC535	5HK-D5	
C40	470		3SC218-8	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	
C41	10000		3SC218-9	D1-01	DD-103		GP-10000	DC51	5HK-S1	
C42	10000		3SC218-18	D1-01	DD-103		GP-10000	DC51	5HK-S1	
C43	.15									
C44	10000		3SC218-19	D1-01	DD-103		GP-10000	DC51	5HK-S1	
C45	.047	300	3SC302-11	BPD-05	DF-503	CU54S47		GEM-4147	5TM-S47	
C46	5000		3SC175-30	D1-005	DD-502	L10D5	GP-5000	DC535	5HK-D5	
C47	10000		3SC175-3	D1-01	DD-103		GP-10000	DC51	5HK-S1	
C48	100		3SC218-23							
C49	.0047	600	3SC301-8	BPD-0047	DD-472	CU54D47	GP-4700	GEM-4347	5TM-D47	
C50	1000	3000	3SC175-27	BYD-30-1000	DD30-102	BYB30D1		DC3021	30GA-D1	
C51	33	500	3SC302-15	P488N-33		CU51S33		GEM-3232	5TM-P33	
C52	.0033	600	3SC311-3	BPD-0022	DS-322	CU54D22	GP-2200	GEM-4322	4TM-D22	
C53	500		3SC219-234	D1-050	DD-151	L10T15	ED-150	UC-5315	5GA-T15	
C54	.1	400	3SC311-13	P488N-1	DF-104	CU54P1		GEM-401	4TM-P1	
C55	1000		3SC218-4	BPD-001	DD-102	BYA10D1M	ED-1000	DC531	5HK-D1	
C56	1000		3SC218-8	BPD-001	DD-102	BYA10D1M	ED-1000	DC531	5HK-D1	
C57	5000		3SC218-13			L10D5				
C58	.047	600	3SC302-8	BPD-03	DF-503	CU54S47		GEM-4137	4TM-S47	
C59	.047	600	3SC311-7	BPD-05	DF-503	CU54S47		GEM-4147	4TM-S47	
C60	.1	400	3SC311-13	P488M-1	DF-104	CU54P1		GEM-401	4TM-P1	
C61	.0047	600	3SC302-4	BPD-0047	DD-472	CU54D47	GP-4700	GEM-4347	4TM-D47	
C62	.047	300	3SC302-6	BPD-05	DF-503	CU54S47		GEM-4147	5TM-S47	
C63	360		2SC329-343							
C64	1000		3SC218-6				ED-1000			
C65	3900	300	3SC326-468							
C66	470		2SC329-346							
C67	1000		3SC218-5				ED-1000			
C68	.047	600	3SC311-11	BPD-05	DF-503	CU54S47		GEM-4147	4TM-S47	
C69	.047	600	3SC311-11	BPD-05	DF-503	CU54S47		GEM-4147	4TM-S47	
C70	47	4000	3SC175-32							
C71	.1	600	3SC301-15	P488M-1	DF-104	CU54P1		GEM-401	5TM-P1	
C72A	10000	}	3SC218-3	BPD-XXM	DDM3-103	BYD4D1M	GP-10000	DC51	5HK-S1	
B	10000						GP-10000	DC51		

PARTS LIST AND DESCRIPTIONS

CAPACITORS (cont)

ITEM No	RATING		REPLACEMENT DATA						NOTES
	CAP	VOLT	Spartan PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C73	1	400	(Note 3)	BPD-0010	DP-104	CU54P1		GEM-401	4TM-S1	Note 3
C74	680		3SC218-4	BPD-00680	DD-681	BYA10T68	ED-680	UC-5368	5GA-T68	

Note 2: Some versions may use 8.5MM F in this application.
Note 3: Some versions may use .05MFD @ 500V in this application. (Part #2SC175-7)

CONTROLS

ITEM No	RATING		REPLACEMENT DATA						INSTALLATION NOTES
	RESISTANCE	WATTS	Spartan PART No.	CENTRALAB PART No.	CARBOSTAT PART No.	IRC PART No.	MALLORY PART No.		
R1A	1Meg	½	230135-1	B-70-8	A4T-1Meg-2	Q13-157	U33		Volume - Note :
B	Shaft			Not Req.	FS-2	Not Req.	Not Req.		
C	Switch			Not Req.	SWE-13	T8-1	US-26		
R2A	500Ω	½	230136-56				UTHR		Contrast
B	Shaft						Not Req.		
R3A	50K	½	230133-1	Not Req.	A4T-50K-8	Q11-133	TA54L		Horiz. Hold
B	Shaft			Not Req.	FS2-1/4	Not Req.	Not Req.		
R4A	200K	½	230132-3	Not Req.	A4T-200K-8	Q11-129	U43		Brightness
B	Shaft			Not Req.	FS2-1/4	Not Req.	Not Req.		
R5A	1.25Meg	½	230132-3	Not Req.	A4T-1.5Meg-8	Q11-156	TA55L		Vertical Hold
B	Shaft			Not Req.	FS2-1/4	Not Req.	Not Req.		
R6A	50K	½	230132-4	Not Req.	A4T-500K-2	Q13-135	TA55A		Tone
B	Shaft			Not Req.	AK-1	Not Req.	Not Req.		
R7A	2.5Meg	½	230146-2	Not Req.	A5-25	Q11-253	TA55L		Vertical Height
B	Shaft			Not Req.	FS2-1/4	Not Req.	Not Req.		
R8	3300Ω	1	230130-3				FL-4K		Vert. Linearity (Wire-wound)

Note 1. Part #230126-46 used in chassis V21-01AA & U21-01AA.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No	RATING		REPLACEMENT DATA			NOTES
	OHMS	WATT	Spartan PART No.	IRC PART No.		
R9	100K		230104-65	BTS-100K		
R10	470K		230104-94	BTS-470K		
R11	470K		230104-94	BTS-470K		
R12	680Ω		230104-60	BTS-680		
R13	3300Ω		230104-72	BTS-3300		
R14	33K		230104-80	BTS-33K		
R15	330K		230104-92	BTS-330K		
R16	3300Ω		230104-72	BTS-3300		
R17	680Ω		230104-60	BTS-680		
R18	820K		230104-97	BTS-820K		
R19	100K		230104-65	BTS-100K		
R20	6800Ω		230104-71	BTS-6800		
R21	10K		230104-74	BTS-10K		
R22	150Ω		230104-53	BTS-150		
R23	4700Ω	1	230105-70	BTA-4700		Note 1
R24	9.1Meg 5%		230094-254			
R25	33K		230104-80	BTS-33K		
R26	68K		230104-84	BTS-68K		
R27	330K 5%		230094-318	BTS-330K 5%		
R28	56K 5%		230094-201	BTS-56K 5%		
R29	820K 5%		230094-239	BTS-820K 5%		
R30	100Ω		230104-50	BTS-100		
R31	68000 5%		230094-179	BTS-6800 5%		
R32	1000Ω		230104-53	BTS-1000		
R33	56Ω		230104-47	BTS-56		
R34	11K 5%		230094-185	BTS-11K 5%		
R35	100Ω		230104-53			
R36	1000Ω		230104-53	BTS-1000		
R37	56Ω		230104-47	BTS-56		
R38	33000 5%		230094-181	BTS-33000 5%		
R39	1000Ω		230104-53	BTS-1000		
R40	330Ω		230104-54	BTS-330		
R41	470Ω			BTS-470		
R42	4700 5%		230094-175	BTS-4700 5%		
R43	470K		230104-94	BTS-470K		
R44	4500Ω	5	230073-2			
R45	1000Ω	1	230105-53	BTA-1000		
R46	33K		230105-78	BTA-33K		
R47	33K		230104-78	BTS-33K		
R48	15K		230104-75	BTS-15K		
R49	330Ω		230104-54	BTS-330		
R50	560K		230104-95	BTS-560		
R51	6800Ω		230104-71	BTS-6800		
R53	680Ω		230104-60	BTS-680		

ITEM No	RATING		REPLACEMENT DATA			NOTES
	OHMS	WATT	Spartan PART No.	IRC PART No.		
R53	270K		230104-91	BTS-270K		
R54	1.2Meg 5%		230094-253	BTS-1.2Meg 5%		
R55	1Meg 5%		230094-231	BTS-1Meg 5%		
R56	1Meg		230104-88	BTS-1Meg		
R57	3300Ω		230104-72	BTS-3300		
R58	2100Ω	2	230108-55	BTB-270		
R59	10K		230104-74	BTS-10K		
R60	470K		230104-94	BTS-470K		
R61	4.7Meg		230104-105	BTS-4.7Meg		
R62	1Meg		230104-98	BTS-1Meg		
R63	1Meg		230104-98	BTS-1Meg		
R64	22Ω		230104-78	BTS-22K		
R65	3300 5%		230094-171	BTS-3300 5%		
R66	22Ω		230104-78	BTS-22K		
R67	3300 5%		230094-171	BTS-3300 5%		
R68	2.2Meg		230104-99	BTS-2.2Meg		
R69	22Ω		230104-78	BTS-22K		
R70			230130-3			Note 2
R71	1Meg	1	230105-98	BTA-1Meg		
R72	11K ½		230094-184	BTS-11K ½		
R73	1000Ω		230104-53	BTS-1000		
R74	3000 ½		230094-148			
R75	3000 ½		230094-148			
R76	270K		230104-91	BTS-270K		
R77	270K		230104-91	BTS-270K		
R78	100K		230104-65	BTS-100K		
R79	100K		230104-88			
R80	470K		230104-94			
R81	4.7Meg		230104-105	BTS-4.7Meg		
R82	68000 ½		230094-179	BTS-6800 ½		
R83	15000 5%		230094-183	BTS-1500 5%		
R84	100K ½		230094-207			
R85	120K 5%			BTS-120K 5%		Note 3
R86	12K		230104-75			
R87	470K		230104-94			
R88	12K	5	230071-14	1 3/4A-12K		
R89	1500Ω	1	230105-54	BTA-1500		
R90	2.2Ω	2	230104-41			
R91	6800Ω		230104-72	BTS-6800		
R92	5.6Ω	1	230107-3	SWI-3.9		
R93	1200Ω	1	230105-52	BTA-1200		Note 4
R94	680Ω		230104-60	BTS-680		
R95	120K		230130-1	BTS-120K		

Note 1: Not used in some versions.
Note 2: Negative temp. comp. resistor (approximately 900K cold).
Note 3: A 150K 5% resistor is used in some versions. (Part #230094-311)
Note 4: A 2200Ω 3W resistor is used in some versions. (Part #230105-56)

TRANSFORMER (POWER)

ITEM No.	RATING		REPLACEMENT DATA						
	PRI	SEC. 1	SEC. 2	SEC. 3	Spartan PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC	275VCT	5V	6.3V	3000T7-1	P9733 ①	P3077 ①	P-8335 ②	26R33 ① ②	R-53C ① ② ③
	1.16A	2x .210A	2.3A	2x 6.5A						

① Fabricate mounting.
② Use original mounting bracket.
③ Parallel and phase 6.3V filament windings.
④ Parallel and phase 6.3V, 5A windings.
⑤ Tape 6.3V, 1.2A winding.
⑥ Tape low high voltage winding; tape 5V, 2A winding.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA								
		Spartan PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	Vert. Osc. Trans.	3202S3-1							
T3	Horiz. Output Trans.	3202S3-1							
T4	Vert. Output Trans.	3205S7-1	21S07 ①	A-3824 ①		V31S.1 ①	A-8283*	FLY-72* ①	
T5A	Yoke(90°) Horiz.(21AH1)	3205S7-1	DF607 ①	MDF-93-5	225D1 ①	Y90F19.43	A-8141 ②	28S34 ②	A-109X ② ③
B	Vert(53AH2)	3205S12-5					DY-.6A ①	Y-18.2	Y-41-1 ①
T6	Width Coil (4-31M3)	3205S2-1	RF800 ① ②	MWC-10 ① ②	214R1 ① ②	20R83A ②		WC-12 ①	WC-24 ① ②	WC-11 ① ②

① Cut and tape blanking lead.
② Drill new mounting hole(s).
③ Connect as auto trans.
④ Yoke rear cover.
⑤ Use original yoke damping network.
⑥ Use terms 1 and 3.
⑦ Use black and white terms.
⑧ Use terms C and B.
⑨ Use orig. mounting bracket.
⑩ Use coil (L5).
⑪ Use red and blue terms.
* This part may be superseded by Parts Manufacturer's introduction of special unit for this application.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
8					8	8	
5					5	5	6
3					3	2	2
4					4	4	2
1					1	1	1
Connect Width Coil Across:	1 & 2				1 & 2	1 & 2	
Special Notes							⑬

⑬ If insufficient width, add capacity (approx. 50-100MMF @ 4KV) across horiz. yoke.

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE	REPLACEMENT DATA					
	PRI SEC	Spartan Part No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No	Triad PART No.
T7	3.5K 3-4Ω	3200S8-3	S2007	A-3518	A-3849	25S50	S-53X

COILS (RF-IF)

ITEM No.	USE	Spartan PART No.	NOTES
L1	Antenna Input Trans.	3604S1-3	
L2	RF Choke	3605S1-8	
L3	RF Choke	3605S1-9	

ITEM No.	USE	Spartan PART No.	NOTES
L4	IF Output Coil	3605S4-1	
L5	IF Input Coil	3605S4-2	
L6	RF Choke	3605S1-1	
L7	RF Choke	3605S1-7	

ITEM No	USE	REPLACEMENT DATA				NOTES
		Spartan PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L8	1st Video IF	3605S4-1			TV-131	6325
L9	2nd Video IF	3605S4-1			TV-130	6319
L10	3rd Video IF	3605S7-1			TV-3003	6323
L11	Shunt Peaking Coil	3605S2-10			19-3560	6146
L12	Series Peaking Coil	3605S2-18			19-3350*	6187*
L13	Shunt Peaking Coil	3605S2-18			19-3300	6130
L14	1st Sound IF	3605S7-1				
L15	2nd Sound IF	3605S0-1				1481
L16	Quadrature Coil	3605S1-1				
L17	Ant. Trap Coil					
L18	Ant. Trap Coil					

ITEM No	USE	REPLACEMENT DATA				NOTES
		Spartan PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L8	1st Video IF	3605S4-1			TV-131	6325
L9	2nd Video IF	3605S4-1	17-4533		TV-130	6319
L10	3rd Video IF	3605S7-1	17-5003		TV-3003	6323
L11	Shunt Peaking Coil	3605S2-10	19-3560			6146
L12	Series Peaking Coil	3605S2-18	19-3350*		TV-186*	6187*
L13	Shunt Peaking Coil	3605S2-18	19-3300		TV-185	6130
L14	1st Sound IF	3605S7-1				
L15	2nd Sound IF	3605S0-1				1481
L16	Quadrature Coil	3605S1-1				
L17	Ant. Trap Coil					
L18	Ant. Trap Coil					

Include Trap 600 Microhenries
235 Microhenries; Wound on 39K resistor.
275 Microhenries

* Parallel with 39K resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Spartan PART No.	MEISSNER PART No.	MERIT PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	
L19	53Ω		3605S8-1					HS-7	17.5-48 Millihenries

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D.C. RESISTANCE	INDUCTANCE @ CURRENT 1000 ~	Spartan PART No.	Halldorson PART No	Merit PART No	Stancor PART No	Thordarson PART No	Triad PART No.
L20	210A	3.4Ω	45HY	3200S8-3	C9040 ①	C-2974 ①	C-2528 ①	25C41 ①	C-324 ①

① Drill one new mounting hole.

COMPONENT COMBINATIONS

ITEM No	USE	DESCRIPTION	Spartan PART No.	REPLACEMENT DATA	
K1	Vertical Integrator	2000MMF, 5000MMF, 5000MMF, 22K, 620Ω, 820Ω	253186-1	Aerovox Centralab Cornell-Dubilier Erie Sprague	PA-110 PC-100 1N75M1 1406-01 V-1

PARTS LIST AND DESCRIPTIONS (Continued)

SELENIUM DIODE

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	Spartan PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1		530045-1		1T1 ①				Horiz. Phase Det. (Pigtail) ① 2 required.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Spartan PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	3AG S/B	1/4A 250V	180157-30		312.250 (3AG-1/4A-S/B)	357001	MDL 1/4	4405

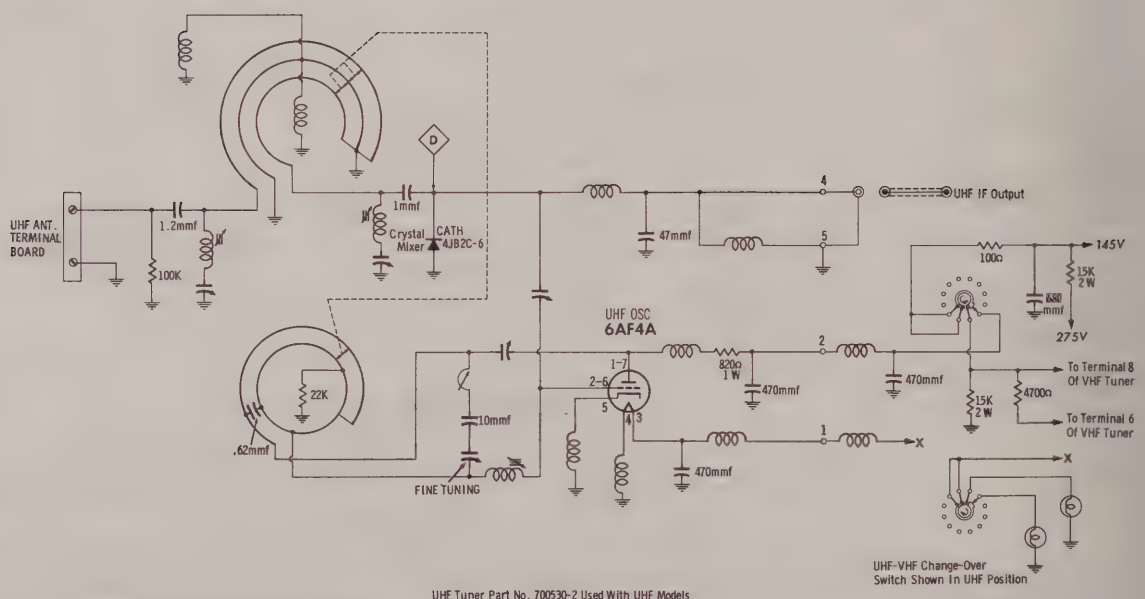
CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA		NOTES
		Spartan PART No.	SYLVANIA PART No.	
M3	1N60*	Note 1	1N60	Video Detector (Pigtail)

* 1N64 may be used in some versions.
Note 1: Part of detector assembly M7 part #360638-1.

MISCELLANEOUS

ITEM No.	PART NAME	Spartan PART No.	NOTES
M4	Pilot Lamp		
M5	Tuner	700541-3	VHF
M6	Tuner	700530-2	UHF, Used in U21 chassis.
M7	Detector Ass'y.	360638-1	Includes crystal (M3), 4th Video IF, 470Ω resistor, 10MMF Cap., and Series Peaking Coil.
M8	Centering Device		
M9	Ion Trap	360492-5	



UHF Tuner Part No. 700530-2 Used With UHF Models

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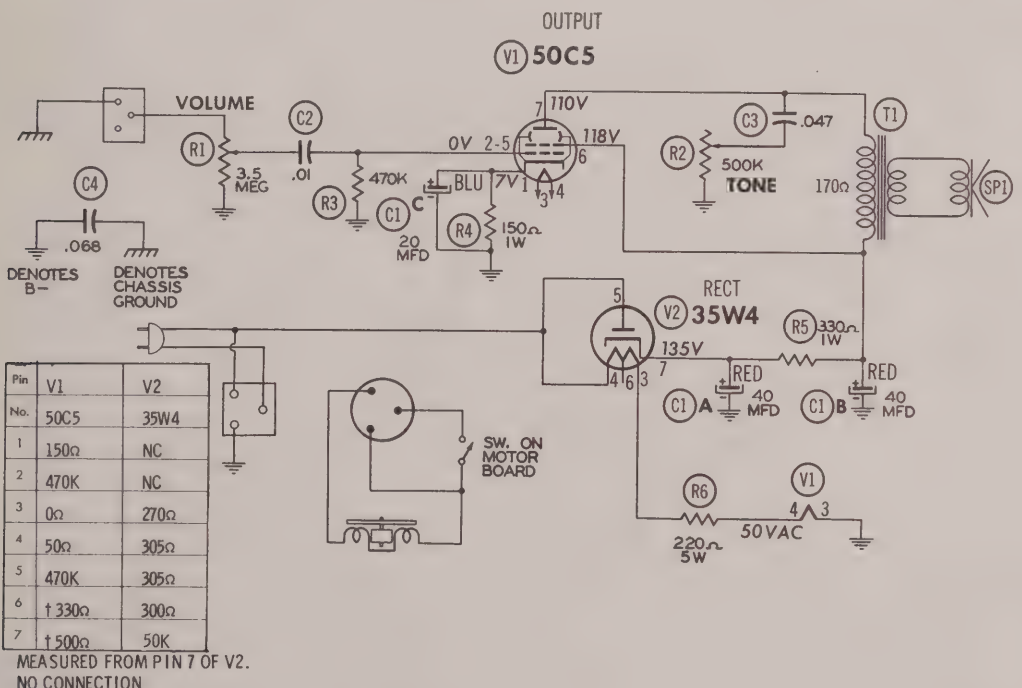
ALTERNATE UHF TUNER SCHEMATIC

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

STEELMAN
MODEL 3A14-1

TRADE NAME	Steelman Model 3A14-1
MANUFACTURER	Steelman Phono & Radio Co., Inc., 12-30 Anderson Ave., Mt. Vernon, N. Y.
TYPE SET	AC Operated Phono Amplifier With 3 Speed Automatic Record Changer
TUBES (Two)	Types 50C5 Output, 35W4 Rectifier
POWER SUPPLY	105-125 Volts AC - 60 Cycles RATING . 86 Amp. @ 117 Volts AC

FOR SERVICE INFORMATION ON THE RECORD CHANGER - SEE SIMILAR V-M MODEL 950 - PHOTOFACT SET 216 - FOLDER 11 OR RECORD CHANGER MANUAL CM-5.



Pin No.	V1	V2
1	150Ω	NC
2	470K	NC
3	0Ω	270Ω
4	50Ω	305Ω
5	470K	305Ω
6	† 330Ω	300Ω
7	† 500Ω	50K

† MEASURED FROM PIN 7 OF V2.
NC NO CONNECTION

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Output	50C5	

ITEM No.	USE	TYPE	NOTES
V2	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	STEELMAN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	40	150		PRS150V40	BBRT44215	TCT3116	TDLT-4	FMT-327	TVA-3448
B	40	150		4020					
C	20	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	STEELMAN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.01	400		BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C3	.047	400		BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C4	.068	200		P288N-068		CUB4S68			4TM-S68	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	STEELMAN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	3.5Meg	½		AB-85	A47-4Meg-Z	Q13-140	U-57	Volume
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	
R2A	500K	½		AB-59	A47-500K-S	Q11-133	U-50	Tone
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	STEELMAN PART No.	IRC PART No.	
R3	470K			BTR-470K	
R4	150Ω	1		BTA-150	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	STEELMAN PART No.	IRC PART No.	
R5	330Ω	1		BTA-330	
R6	220Ω	5		1 3/4A-225	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	STEELMAN PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1.93K	3.2Ω		Z1101	A-3025	A-3332	24S50 ①	S-12X	① Drill one new mtg. hole.

SPEAKER

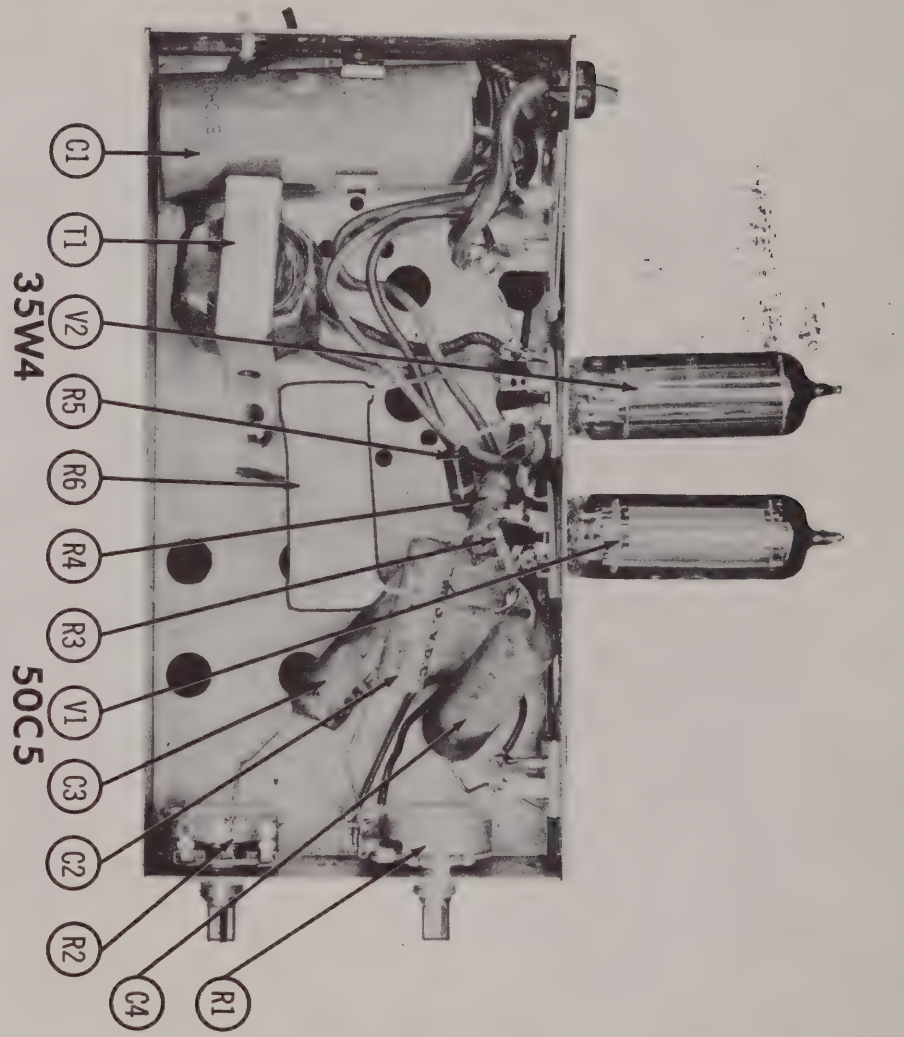
ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	STEELMAN PART No.	QUAM PART No.	
SP1	4 X 6"	PM	3.2Ω		46A07	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	STEELMAN PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1		64-TS	K and K-78			

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

CHASSIS—BOTTOM VIEW



PHONO NEEDLE

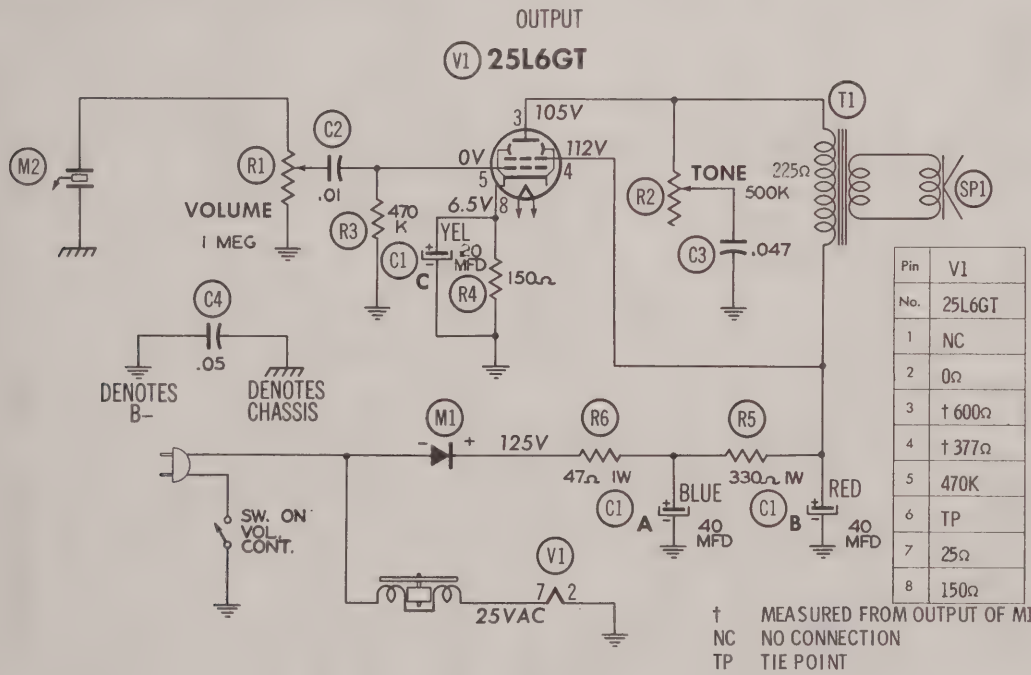
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	STEELMAN PART No.	JENSEN PART No.	WALCO PART No.	
M2		*A-76LP or †A-67LP or ♦A-67LPD and *A-76 or †A-67 or ♦A-67D	*W-39MGA and *W-39A	* Metal † Jewel ♦ Diamond

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

STEELMAN
MODEL 3D12

TRADE NAME	Steelman Model 3D12
MANUFACTURER	Steelman Phono & Radio Co., Inc., 12-30 Anderson Ave., Mt. Vernon, N.Y.
TYPE SET	AC Operated Phono Amplifier With 3 Speed Manual Record Player
TUBES (One)	Type 25L6GT Output
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .35 Amp. @ 117 Volts AC



Pin No.	V1 25L6GT
1	NC
2	0Ω
3	† 600Ω
4	† 377Ω
5	470K
6	TP
7	25Ω
8	150Ω

† MEASURED FROM OUTPUT OF M1.
NC NO CONNECTION
TP TIE POINT

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Output	25L6GT	

ITEM No.	USE	TYPE	NOTES

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	STEELMAN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	40	150		PRS150V404-020	BBRT44215	TCT3116	TDLT-4	FMT-315	TVA-3448
B	40	150							
C	20	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	STEELMAN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.01	400		BPD-01	D6-103	CUB4S1	ED-01	GEM-411	4TM-S1	
C3	.047	400		BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C4	.05	400		BPD-05	DF-503	CUB4S5		GEM-415	4TM-S5	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	STEELMAN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1Meg	½		AB-70	A47-1Meg-2	Q13-137	U-53	Volume
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	
C	Switch			KB-1	SWE-12	76-1	US-26	
R2A	500K	½		AB-59	A47-500K-S	Q11-133	U-50	Tone
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	STEELMAN PART No.	IRC PART No.	
R3	470K			BTS-470K	
R4	150Ω			BTS-150	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	STEELMAN PART No.	IRC PART No.	
R5	330Ω	1		BTA-330	
R6	47Ω	1		BTA-47	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	STEELMAN PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1930Ω	3-4Ω		Z1101	A-3025	A-3332	24S50 ①	S-12X	① Drill New Mtg. Hole

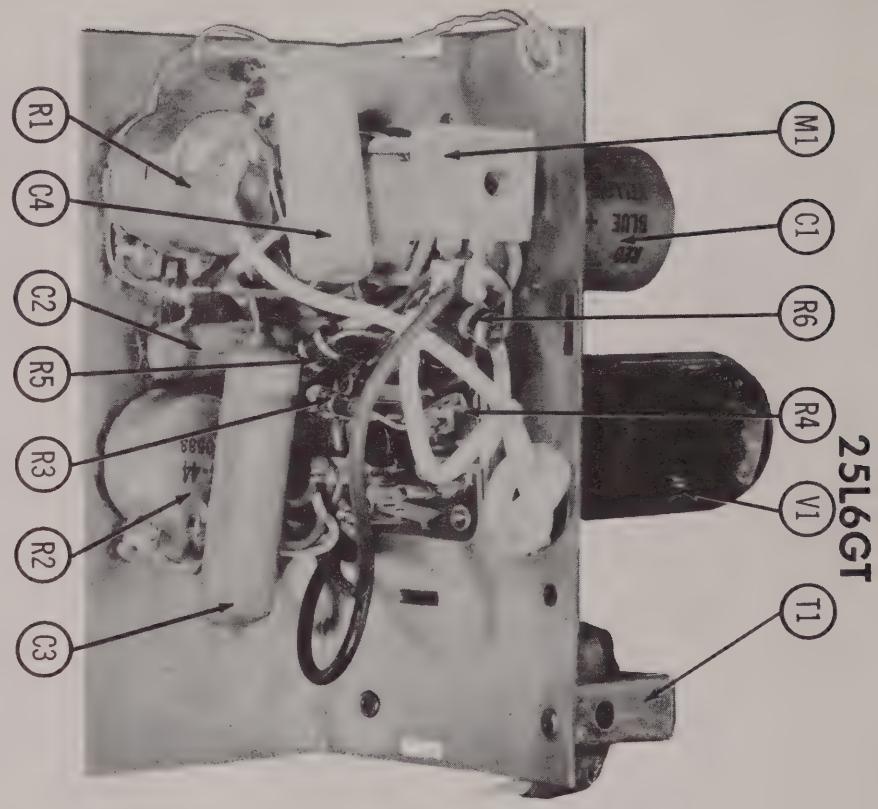
SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	STEELMAN PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω		4A07	

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	STEELMAN PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.050A		1263A	RS050	6S65	8J1	65	

CHASSIS—BOTTOM VIEW



PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	STEELMAN PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	MOUNT	
M2		66-TS *P66T	K and K-78	*24H60		* Complete Tone Arm And Cartridge Assembly.

ASTATIC NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

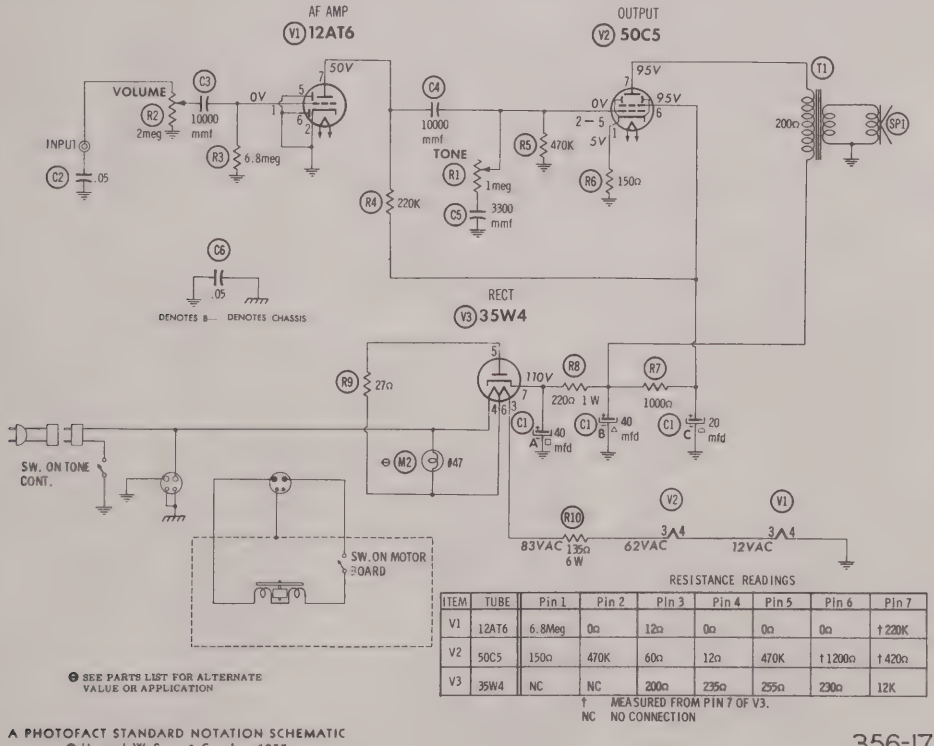
ITEM No.	REPLACEMENT DATA			REMARKS
	STEELMAN PART No.	JENSEN PART No.	WALCO PART No.	
M3		*A-76 or †A-67 or ♦A-67D and *A-76LP or †A-67LP or ♦A-67LPD	*W-39A or *W-39MGA	* Metal † Jewel ♦ Diamond

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

WEBCOR
MODEL 1653

TRADE NAME	Webcor Model 1653
MANUFACTURER	Webcor Inc., 5610 Bloomingdale Ave., Chicago 39, Ill.
TYPE SET	AC Operated Phono Amplifier With 3 Speed Automatic Record Changer
TUBES (Three)	Types 12AT6 AF Amplifier, 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC - 60 Cycles RATING .22 Amp. @ 117 Volts AC

FOR SERVICE INFORMATION ON RECORD CHANGER - SEE WEBCOR 141 - PHOTOFACT SET 321 FOLDER 13.



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12AT6	6.8Meg	0Ω	12Ω	0Ω	0Ω	0Ω	†220K
V2	50C5	150Ω	470K	60Ω	12Ω	470K	†1200Ω	†420Ω
V3	35W4	NC	NC	200Ω	235Ω	255Ω	230Ω	12K

† MEASURED FROM PIN 7 OF V3.
NC NO CONNECTION

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amplifier	12AT6	
V2	Output	50C5	
V3	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA WEBCOR PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■40	150	30P243	AFH3-43-50		FP376. 9			
B	▲40	150							
C	●20	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA WEBCOR PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	.05	400	30P255	BPD-05	DF-503	CUB4S5		PT415	4TM-S5	
C3	10000		30P256	BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C4	10000		30P254	BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C5	3300		30P253	BPD-0033	DD-332	K077	811-0033	UC-5233	5HK-D33	
C6	.05	400	30P255	BPD-05	DF-503	CUB4S5		PT415	4TM-S5	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA WEBCOR PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	1Meg	½	31P102					Tone & Switch
R2	2Meg	½	31P101					Volume

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA WEBCOR PART No.	IRC PART No.	NOTES
R3	6. 8Meg		29S6852	BTS-6. 8Meg	
R4	220K		29S2242	BTS-220K	
R5	470K		29S4742	BTS-470K	
R6	150Ω		29M1512	BTS-150	
R7	1000Ω		29S1022	BTS-1000	
R8	220Ω	1	29S2213	BTA-220	
R9	27Ω		29M2702	BTS-27	
R10	135Ω	6	29P065		

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA WEBCOR PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2600Ω	3-4Ω	67P047-4	Z1001	A-2928	A-3876	24S50	S-1X	

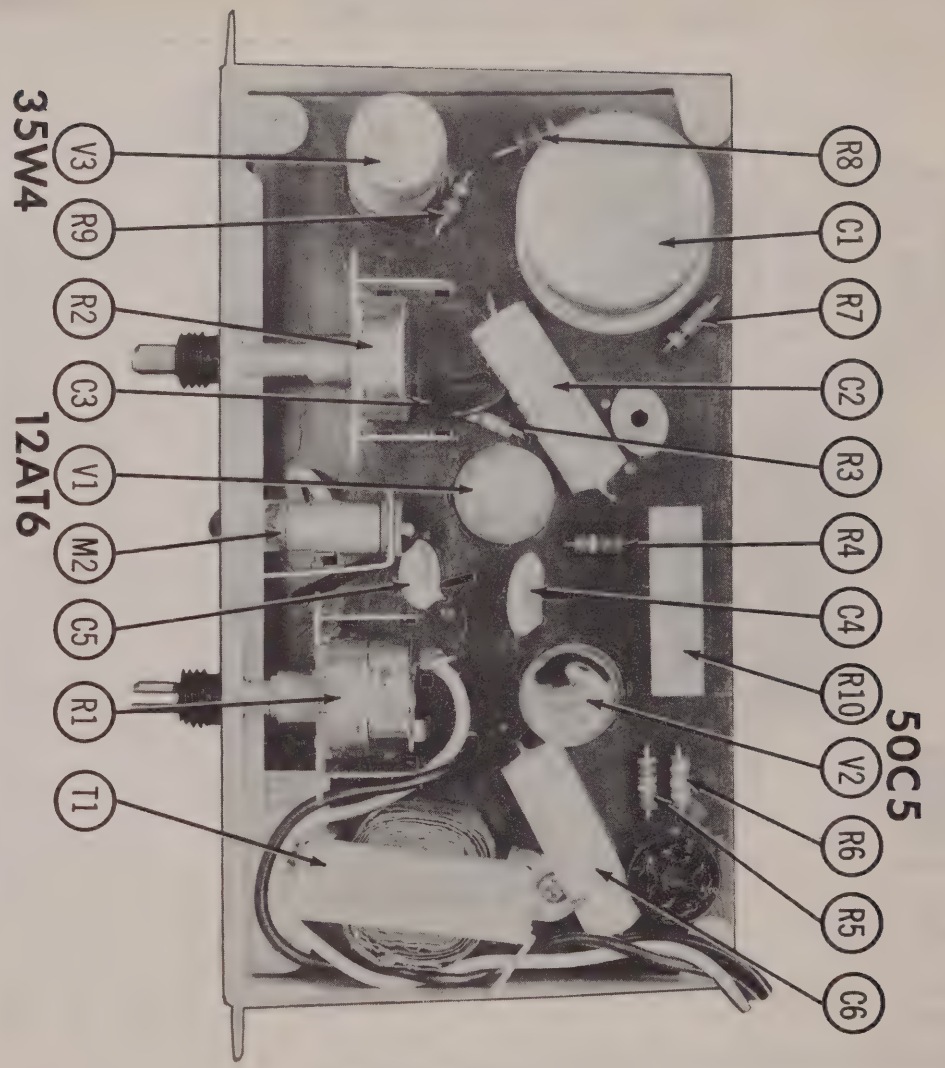
SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA WEBCOR PART No.	QUAM PART No.	NOTES
SP1	5"	PM	3-4Ω	76P011	5A07	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA WEBCOR PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. MOUNT	REMARKS
M1				76	*PT-1	* Not required unless original mounting is damaged.

CHASSIS—TOP VIEW



MISCELLANEOUS

ITEM No.	PART NAME	WEBCOR PART No.	NOTES
M2	Pilot Light		#47 (Not used in all versions.)
	Case	80X131-1	Russet & Beige.
	Case	80X131-2	Green & Beige.
	Knob	39P142-1LS	Volume.
	Knob	39P142-2LS	On-Off-Tone.
	Handle	39P049-3	Russet
	Handle	39P049-4	Green

PHOTOFACT* Folder

WESTINGHOUSE MODELS H-17T175, C, H-17T176, H-17T177, H-17TU175, H-17TU176, H-17TU177 (Ch. V-2370-24, 42, V-2380-201)

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WESTINGHOUSE MODEL H17T175C (Ch. V-2370-42)

TRADE NAME	Westinghouse	MODELS	CHASSIS
		H17T175, H17T176, H17T177	V-2370-24
		H17T175C	V-2370-42
		H17TU175, H17TU176, H17TU177	V-2380-201
MANUFACTURER	Westinghouse Electric Corp., Television & Radio Div., Metuchen, N. J.		
TYPE SET	Television Receiver		
TUBES	Sixteen		
POWER SUPPLY	105-120 Volts AC, 60 Cycles	RATING 120 Watts, 1.15 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

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Tube Failure Check Chart 3
Tube Placement Chart 3

WESTINGHOUSE MODELS H-17T175, C, H-17T176, H-17T177, H-17TU175, H-17TU176, H-17TU177 (Ch. V-2370-24, 42, V-2380-201)

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DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 4 push-on type knobs from side of cabinet.
2. Remove 6 metal screws and the rear cover.
3. Remove 2 speaker leads, picture tube socket, Ion trap and HV lead.
4. Remove 2 speaker nuts and the speaker.
5. Remove 1 metal screw holding top of chassis to the top bracket of the cabinet.
6. Remove 4 chassis bolts from the bottom.
7. Remove the chassis.

CAUTION NOTE

ONE SIDE OF AC LINE CONNECTED TO CHASSIS

Care should be exercised when connecting test equipment or physcially contacting chassis.

MODEL	CHASSIS
H17T175C	V-2370-42

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF oscillator is possible by removing the channel selector and fine tuning knobs. Set the fine tuning at the center of its range. One slug for HIGH band adjustment is located at 4 o'clock, and should be adjusted first. The LOW band adjustment is located at 1 o'clock. Adjust for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

1. Remove 4 metal screws, 2 from the bottom, nearest the front, and one from each side. Insert screwdriver into slot in bottom and pry out bottom of safety glass and mask. Pull bottom of mask out and down to remove from 2 tabs at top.

FOCUS

Adjust the Ion trap for the best focus consistent with maximum brightness.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator, it is necessary to remove the rear cover and supply power to set. Set the horizontal hold at the center of its range and adjust the horiz. freq. slug (B2) until the picture synchronizes horizontally. (For location see tube placement chart.)

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate audio detector buzz, adjust the quieting control for MINIMUM buzz and maximum sound. (For location see tube placement chart.)

FUSES

A 4.7Ω fusible resistor (R85) is used for LV power supply protection. (For location see tube placement chart.)

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

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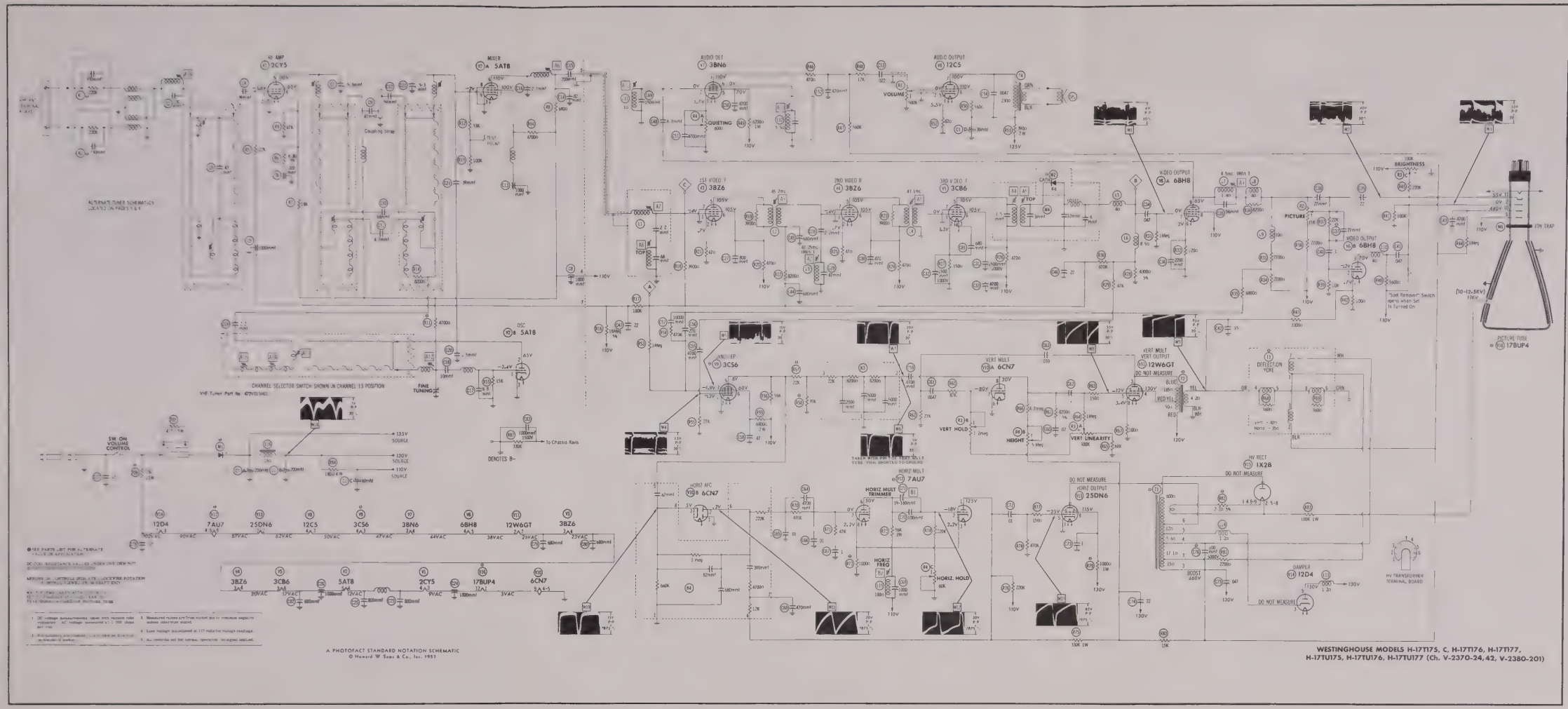
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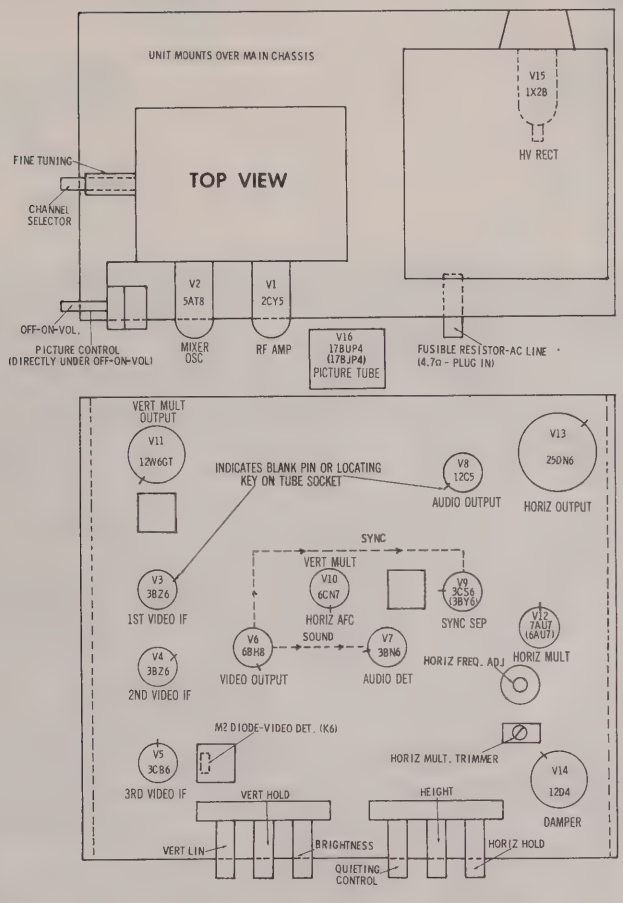
TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

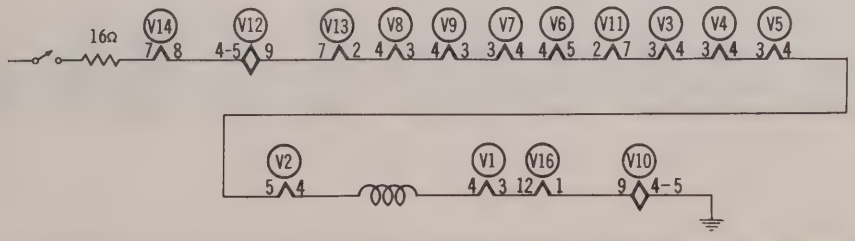
POWER SUPPLY FAILURE
No raster, no sound - **Fusible Resistor (R85), Rectifier (M1)**

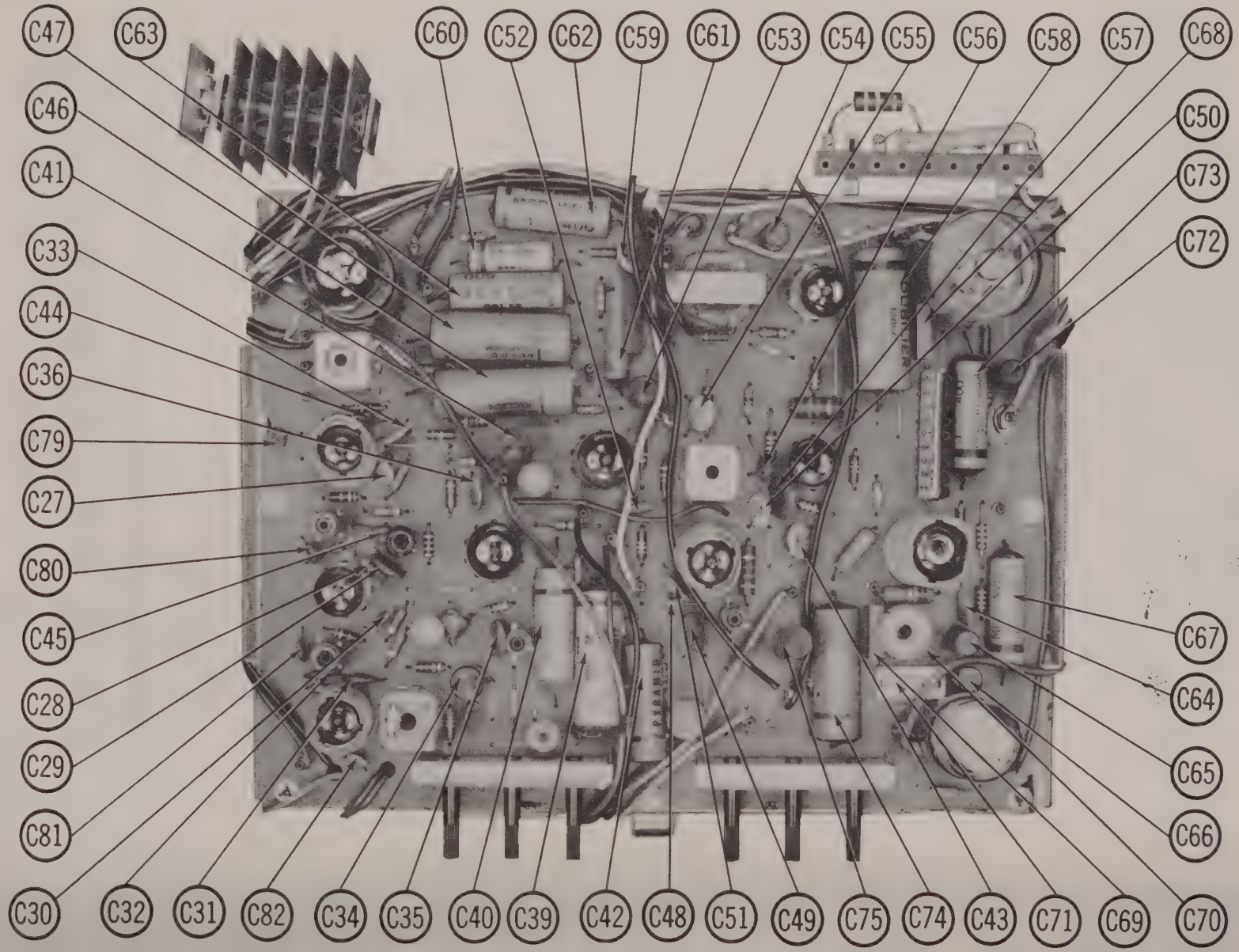
LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V3, V4, V5, Diode (M2), V6**
No pic, no sound, has snow - **V1, V2, V3**
No pic, has sound, has raster - **V6, V16**
Has pic, no sound - **V7, V8**

SYNC FAILURE
No vert. sync - **V9**
No horiz. sync - **V9, V10**
No vert. or horiz. sync - **V9**

SWEEP FAILURE
No raster, has sound - **V10, V12, V13, V14, V15, V16**
No vertical deflection - **V10, V11**
Poor vert. linearity or foldover - **V10, V11**
Poor horiz. linearity or foldover - **V12, V13, V14**
Narrow picture - **V12, V13, V14, M1**
Vert. off freq. - **V10, V11**
Horiz. off freq. - **V12**

This receiver employs tubes used in a series filament network, an open filament in any tube in the series will cause the set to be inoperative. (See circuit below).





CAPACITOR IDENTIFICATION

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ALTERNATE UHF-VHF TUNER SCHEMATIC

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ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The High Voltage lead should be securely taped and kept away from the chassis.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt bias supply to point Ⓐ. Positive to B-.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001MFD	High side to point Ⓒ. Low side to B-.	Not Used	43.1MC (unmod)	Any unused channel.	USE VTVM DC probe to point Ⓑ. Common to B-.	A1	Keep the generator output adjusted to provide a constant -1 volt output on VTVM. Adjust A1 for maximum deflection.
2.	"	"	"	47.25MC	"	"	A2	Adjust for MINIMUM deflection.
3.	"	"	"	45.2MC	"	"	A3	Adjust for maximum deflection.
4.	"	"	44MC (10MC Swp)	42.25MC 43.0MC 45.0MC 45.75MC	"	Vert. amp. thru 47K to point Ⓑ. Low side to B-. Connect a 470MMF capacitor across scope terminals.	A4, A5	Use only enough sweep generator output to provide usable pattern on scope.
5.	Fig. 2	Across antenna terminals thru matching network (Fig. 2).	213MC (10MC Swp)	211.25MC 215.75MC	13	"	A6, A7, A8	Adjust A6 and A7 for maximum amplitude and correct position of 211.25MC marker (at 50%). Adjust A8 to place 215.75MC marker in trap notch. (See Fig. 3)

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
6.	.001MFD	High side to point Ⓑ. Low side to B-.	4.5MC (unmod)	Any unused channel.	DC probe thru detector (Fig. 4) to pin 11 (cathode) of picture tube. Common to B-.	A9	Use high generator output and adjust A9 for MINIMUM deflection.

SOUND IF ALIGNMENT USING ON THE AIR SIGNAL

1. Tune in a TV station and connect an attenuator between the antenna and receiver terminals so that the signal may be varied from strong to weak.
2. Set the quieting control (R4A) located on the back of the chassis at mid-range.
3. Apply a strong signal to the receiver and adjust A10 for maximum sound output. If peak appears at two different positions that are widely separated, use the one with the slug farthest counter clockwise. If two peaks occur within a narrow range of adjustment, sufficient signal is not being supplied to the receiver and must be increased, or the quieting control is not set at the desired position.
4. Adjust A11 for maximum sound output. If peaks occur at two different points of adjustment, use the one with the slug farthest counter clockwise. Reduce the signal to its lowest usable level and recheck adjustments.
5. Reduce the signal input to the receiver until noise can be heard and adjust the quieting control (R4A) for MINIMUM noise and hiss. It is imperative that the weakest available signal be used for this adjustment. Do not leave the quieting control set at maximum counter clockwise position.

SOUND IF ALIGNMENT USING TEST EQUIPMENT

Preset the quieting control (R4A) at mid-range position.
Preset the picture control (R2) at maximum.
The marker generator is used in this porcedure as an AM signal generator.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	.01MFD	High side of sweep generator and marker generator to point Ⓑ. Low sides to B-.	4.5MC (15KC Swp)	4.5MC (400∿ 30% AM Mod)	Any unused channel	Across volume control.	A9, A10, A11	Increase generator (AM) until base line is modulated with 400∿ AM. Adjust A10 for MINIMUM AM base line modulation. Reduce the AM signal and repeat adjustment of A10 until base line is flat when A10 is tuned exactly to 4.5MC. Adjust A11 for symmetrical curve similar to Fig. 5. Adjust A9 for maximum amplitude of curve. Recheck adjustment of A10.

OSCILLATOR ALIGNMENT FOR TUNERS #470V013M01 AND #470V013M02

1. Switch to the highest high band channel (7-13) operating in the area and set the fine tuning to the center of its range.
2. Adjust the high band oscillator slug (A12) for the best picture detail and sound quality. See Fig. 6 for slug locations.
3. Switch to channel 6 if operating in the area and adjust the channel 6 oscillator slug (A13) for best picture detail and sound quality.
4. Switch to channel 4 if operating in the area and adjust channel 4 oscillator slug (A14) for best picture detail and sound quality.
5. Switch to channel 2 if operating in the area and adjust channel 2 oscillator slug (A15) for best picture detail and sound quality.

OSCILLATOR ALIGNMENT FOR TUNER #470V016M01

1. Switch to the highest high band channel (7-13) operating in the area and set the fine tuning to mid-range position.
2. Using a non-metallic alignment tool, adjust the high band oscillator slug (A16) for best picture detail and sound quality.
3. Switch to the highest low band channel (2-6) operating in the area.
4. Adjust the low band oscillator slug (A17) for best picture detail and sound quality. Check the previously made adjustment and if the tuning has changed, repeat the above adjustments.

ANTENNA TRAP ALIGNMENT

The antenna trap is adjustable over the IF range of the receiver and is preset at the factory at 44MC. A18 can be adjusted to MINIMIZE any interference in this range.

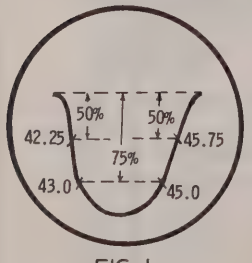
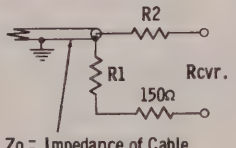


FIG. 1



Zo = Impedance of Cable

Zo	R1	R2
50Ω	56Ω	120Ω
75Ω	82Ω	110Ω

FIG. 2

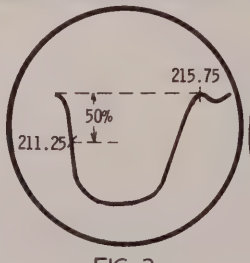


FIG. 3

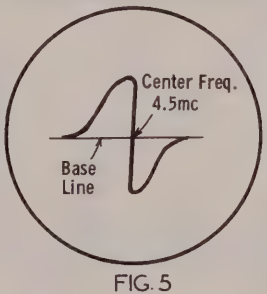


FIG. 5

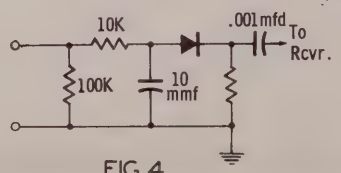


FIG. 4

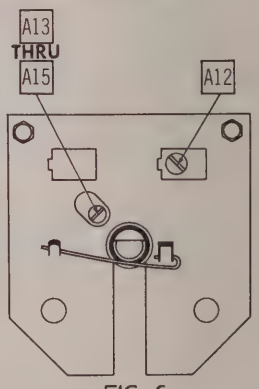


FIG. 6

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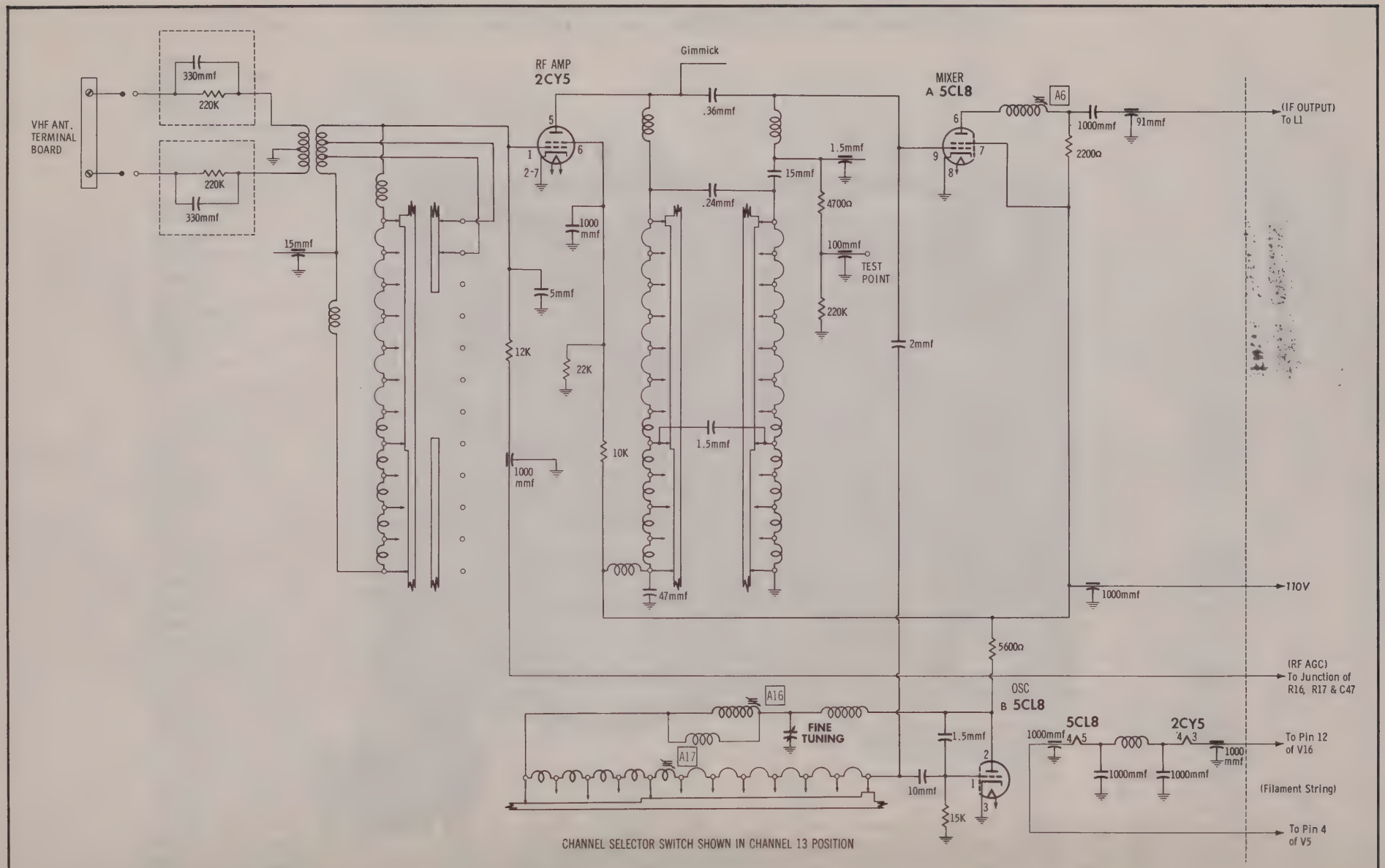

CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION

VHF Tuner Part No. 470V016M01

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ALTERNATE VHF TUNER SCHEMATIC

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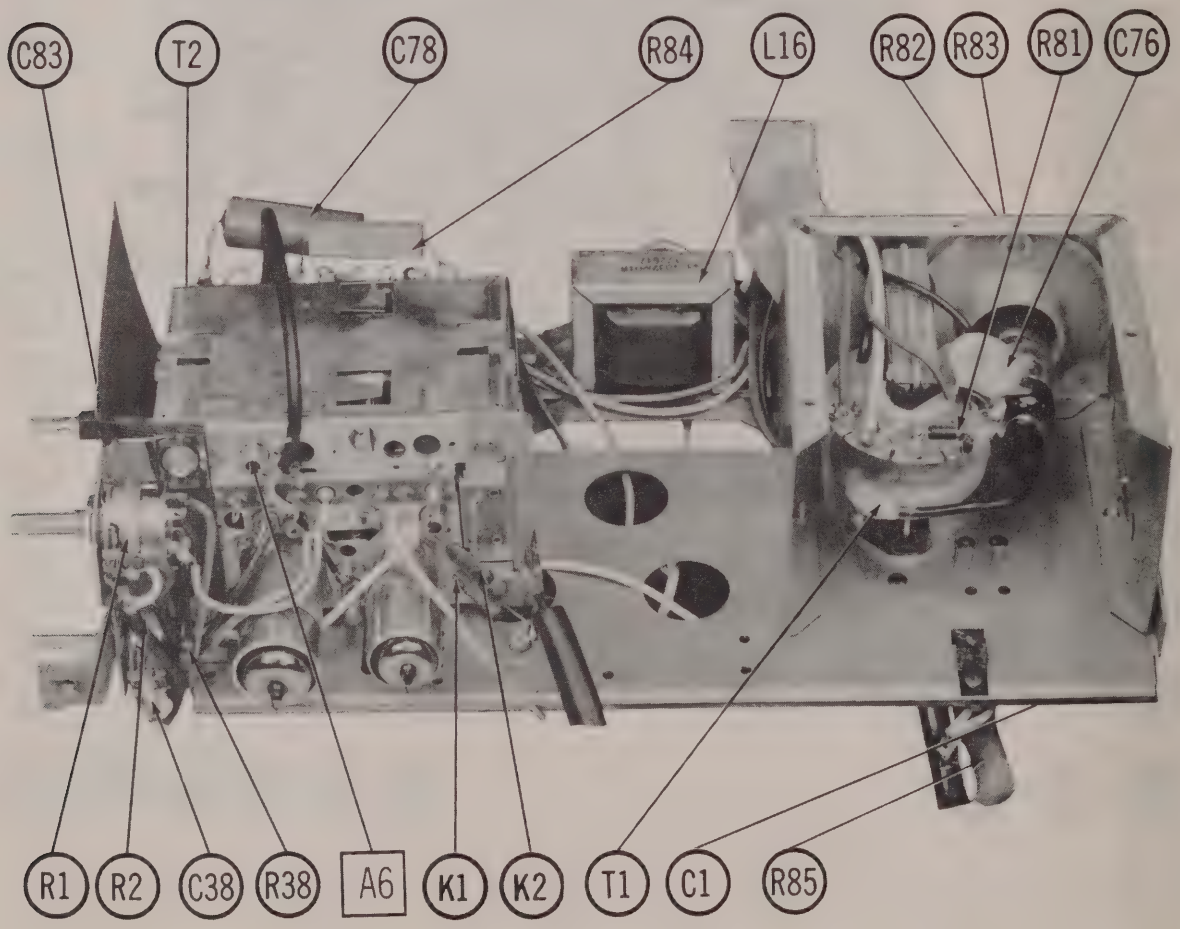
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	2CY5	600K	0Ω	2.5Ω	3Ω	†200Ω	†18K	0Ω		
V2	5AT8	15K	†5000Ω	0Ω	3Ω	4Ω	†900Ω	†5000Ω	0Ω	130K
V3	3BZ6	470K	47Ω	6Ω	5.5Ω	†680Ω	†680Ω	0Ω		
V4	3BZ6	470K	47Ω	5.5Ω	5Ω	†680Ω	†680Ω	0Ω		
V5	3CB6	.1Ω	150Ω	5Ω	4Ω	†680Ω	†680Ω	0Ω		
V6	6BH8	100Ω	10K	†5800Ω	10.5Ω	8.5Ω	120Ω	1Meg	†200Ω	†4000Ω
V7	3BN6	●250Ω	1Ω	11.5Ω	10.5Ω	†8400Ω	5.5Ω	‡560K		
V8	12C5	82Ω	500K	12.5Ω	14Ω	500K	†770Ω	†600Ω		
V9	3CS6	27K	0Ω	11.5Ω	12.5Ω	†30K	†6800Ω	1.5Meg		
V10	6CN7	0Ω	1.7Meg	680K	0Ω	0Ω	0Ω	●1Meg	●†5.2Meg	1Ω
V11	12W6GT	NC	8.5Ω	†230K	†70Ω	●1.2Meg	NC	6Ω	100Ω	
V12	7AU7	†220K	●240K	1000Ω	22Ω	22Ω	†56K	2.8Meg	1000Ω	19Ω
V13	25DN6	NC	14Ω	0Ω	NC	470K	NC	19Ω	1000Ω	TOP CAP ‡11Ω
V14	12D4	NC	NC	¶	NC	†20Ω	NC	24Ω	22Ω	
V15	1X2B	PINS 1 THRU 9 HAVE INFINITE RESISTANCE								TOP CAP ‡530Ω
V16	17BUP4	1Ω	100K	Pin 6 †200Ω	Pin 10 ‡1Meg	Pin 11 ●250K	Pin 12 2.5Ω			

† MEASURED FROM OUTPUT OF M1.
‡ MEASURED FROM PIN 3 OF V14.
● THIS READING WILL VARY, CONTROL SET FOR NORMAL OPERATION.
¶ THIS READING CAN VARY GREATLY, (10K MINIMUM), DUE TO THE CONDITION OF THE ELECTROLYTIC CAPACITOR IN THE ASSOCIATED CIRCUIT.
NC NO CONNECTION



SHELF CHASSIS

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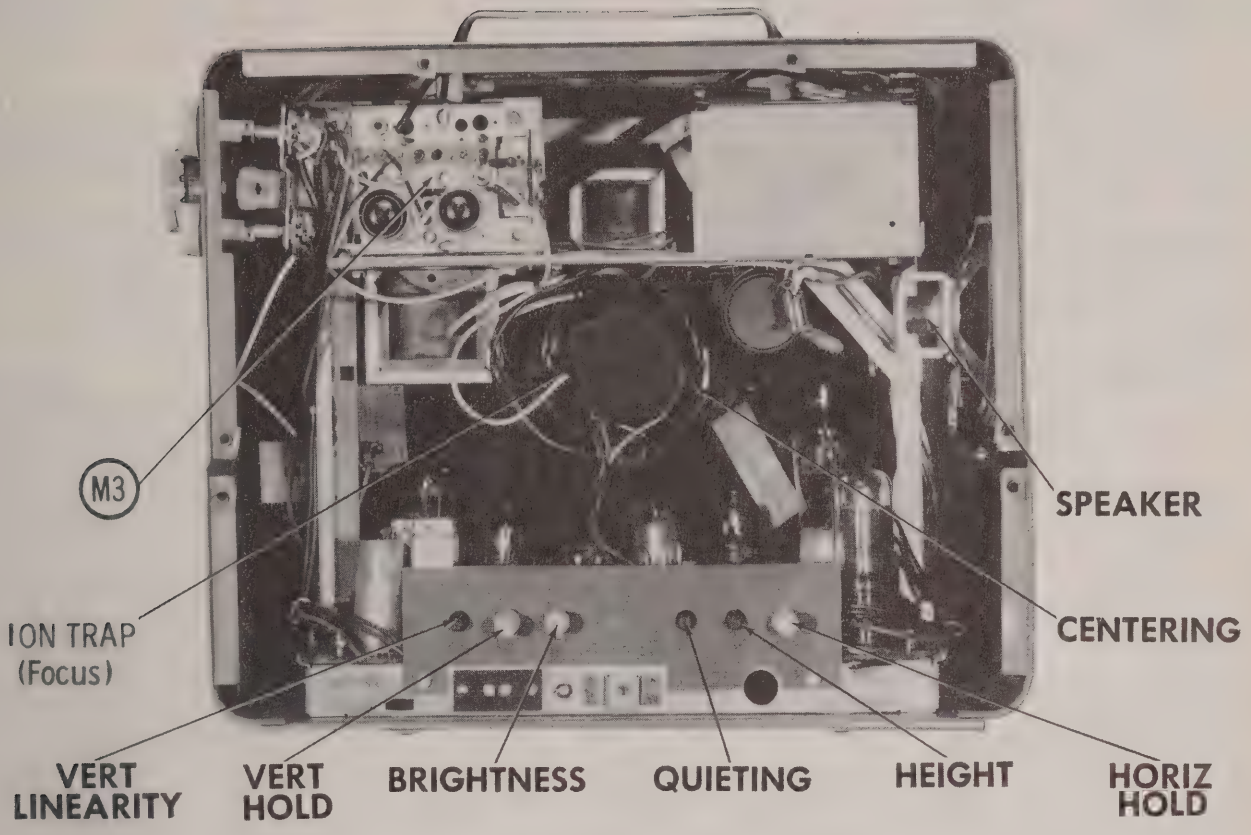


CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

1. Connect a short clip lead across the horizontal frequency coil (L15). This can be done on top of the chassis.
2. Set the horizontal hold control (R4C) to the middle of its range and leave it in this position through the following steps.
3. Connect the DC probe of the VTVM to pin 7 (grid) of the horizontal multi-vibrator (V12) and the common lead to B-.
4. With the receiver tuned to a TV station, adjust the horiz. mult. trimmer (B1) for zero reading on the VTVM. If zero can be approached but not quite reached at on extreme of B1, it may be necessary to set the horizontal hold control SLIGHTLY to one side of mid-range to obtain zero reading on the VTVM.
5. Remove the clip lead from across L15.
6. Adjust the horizontal frequency coil slug (B2) for zero reading on the meter and check the adjustment by switching off channel and back again. The receiver should pull into horizontal synchronization on all channels. If not, repeat adjustments.

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	RF Amp.	3CF3	
V2	Mixer-Osc	5AL8	
V3	1st IF Amp.	3DZ8	
V4	2nd IF Amp.	3DZ8	
V5	3rd IF Amp.	3CB6	
V6	Video Output	6BH8	
V7	Audio Det.	3DH6	
V8	Audio Output	12C5	

Note 1: Some versions may use 3DY8 in this application.
Note 2: Some versions may use 6AU7 or 6AU7A in this application.

ITEM No	USE	TYPE	NOTES
V9	Sync Sep.	3CB8	Note 1
V10	Vert. Mult.-Horiz. AFC	6CM7	
V11	Vert. Mult.-Vert. Output	12W8GT	
V12	Horiz. Mult.	7AU7	Note 2
V13	Horiz. Output	25DN6	
V14	Damper	1B24	
V15	HV Rectifier	1X2B	

PICTURE TUBE

ITEM No	REPLACEMENT DATA: Westinghouse PART No.	GE PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	NOTES
V16	17BL24 / 17BJP4			17BL24 / 17BJP4	① Does not require an ion trap.

ELECTROLYTIC CAPACITORS

ITEM No	RATING: CAP.	VOLT	Westinghouse PART No	REPLACEMENT DATA: AEROVOX PART No	CORNELL DUBILIER PART No	MALLORY PART No	PYRAMID PART No	SANGAMO PART No	SPRAGUE PART No
C1A	+200 -50		218V1084O1	AFH4-01-55	AXD189 / BSH12331S	③ P417-8 / ①CD47	①MD-21 / ①DL-T-2	①-905 / ①-MT-1530	R2387*
C1B	●300 -150								
C1C	+60 -50								
C1D	30 -30								

* New catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING: CAP.	VOLT	Westinghouse PART No.	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	100									HS200
C3	.43									
C4	39			N150-41 39	TCM-39	C16Q39U	TCT-39			
C5	1000			ET-001	MFT-1000				503C-D1	
C6	1000			ET-001	MFT-1000				503C-D1	
C7	1.5-3			839-3			31S5-D	CT565A		
C8	1000			ET-001	MFT-1000				503C-D1	
C9	47			N750-41 47	TCM-47	C16Q47U	TCT-47	MT-5647	5TCC-Q47	
C10	.68				TCZ-R68		TCC-- 68			
C11	6.8			N90-81 6.8	TCZ-6R8	C16Y47C	TCC-6.8	Z7-5547	5TCCB-Y47	
C12	90									
C13	1000			ET-001	MFT-1000				503C-D1	N1500
C14	63									
C15	200			BPD-003	DD-201	L10T3	ED-200	UC-533	5GA-T3	
C16	1.5			N90-81 1.5						
C17	6.8			N90-81 6.8	TCZ-6R8	C16Y56C	TCC-6.8	ZT-5568	5TCCB-Y68	
C18	50			BPD-00001	DD-L00Q1		ED-50	UC-541	5GA-Q1	
C19	3.3			N90-81 3.3	TCZ-3R3	C16Y23C	TCC-3.3	ZT-5523	5TCCB-Y23	N2300
C20	1.5									
C21	.39				839-3		31S5-D	CT565A		
C22	3.3				TCZ-3R3	L10T3	ED-300	UC-538	5GA-T3	
C23	300			BPD-0008	DD-301				503C-D1	
C24	1000			ET-001	MFT-1000		ED-800	UC-538	5GA-T8	
C25	800			BPD-0008	DD-801	L10T8			503C-D1	
C26	300		215V300M18	BPD-0008	DD-301	L10T3	ED-300	UC-538	5GA-T3	
C27	3.3		215V3R3A18	N90-81 3.3	TCZ-3R3	C16Y23C	TCC-3.3		5TCCB-Y23	
C28	47		215Y300M06	N90-81 47	TCZ-47	C16Q47C	TCC-47	ZT-5547	5TCC-Q47	
C29	470		215Y500M07	BPD-0007	DD-471	L10T5	ED-500	UC-5347	5GA-T5	
C30	1500	1000	V10T0-13	BVD-15-1500	DD-152	BD15D15	BD15-1500	DC30S15	20GA-D1	
C31	1500	1000	V10T0-13	BVD-15-1500	DD-152	BD15D15	BD15-1500	DC30S15	30GA-D1	
C32	300		215V300M04	BPD-0007	DD-471	BF5A1DD47	ED-0047	UC-5347	5GA-D47	
C33	.047	600	215V094M73	BPD-05	DF-503	BC86471		ACE647	6SE-547	
C34	47		215Y500M06							N330
C35	3300		215V103A25	BPD-0032	DD-332	BF5A1DD32	ED-0032	UC-5332	5GA-D32	
C36	3300									N330
C37	27									N330
C38	27			P468N-33		CU84P32		GEM-4032	4TM-P32	
C39	.22	400	210V033A34	P468N-21		CU84P21		GEM-4021	4TM-P21	
C40	.1	600	210V031A04	BPD-05	DF-503	BC86471		ACE647	6SE-647	
C41	.047	400	210V094M73	P468N-15		CU84P15		GEM-4015	4TM-P15	
C42	.15	600	210V039M15	BPD-0047	DD-472	BF5A1DD47	ED-0047	UC-5247	5GA-D47	
C43	4700		215V330M04	BPD-0047	DD-682	BF5A1DT68	ED-680	UC-5368	5GA-T68	
C44	680		215V151A81	BPD-00068	DD-681	BF5A1DT68	ED-680	UC-5368	5GA-T68	
C45	680		215V151A81	BPD-00068	DD-681				5GA-T68	
C46	.22	400	210V033A34	P468N-22		CU84P22		GEM-4022	4TM-P22	
C47	.33	600	210V053A34	P468N-33		CU84P32		GEM-4032	4TM-P32	
C48	6.8		217V25A89	N90-81 6.8	TCZ-6R8	C16V68C	TCC-6.8	ZT-5568	5TCCB-V68	
C49	150		215V151A51							N330
C50	4700		215V330M04	BPD-0047	DD-472	BF5A1DD47	ED-0047	UC-5347	5GA-D47	
C51	4700		215V330M04	BPD-0047	DD-472	BF5A1DD47	ED-0047	UC-5347	5GA-D47	
C52	4700		215V330M04	BPD-0047	DD-471	BF5A1DT47	ED-470	UC-5347	5GA-T47	
C53	.022	800	210V023M23	BPD-03	DF-303	BC86D23	ED-03	ACE623	6SE-623	
C54	.0047	600	210V014M72	BPD-0047	DD-472	BC8D47J	GP-4700	ACE6247	6SE-D47	
C55	4700		215V330M04	BPD-0047	DD-472	BF5A1DD47	ED-0047	UC-5347	5GA-D47	
C56	4700		215V330M04	BPD-0047	DD-471	L10T47	ED-470	UC-5347	5GA-T47	
C57	10000		210V010M03	BPD-01	DD-103	BF5A68	ED-01	DC81U	5HK-S1	
C58	4700	400	210V047M04	P468M-47		CU84P47		GEM-4047	4TM-P47	
C59	4700		215V330M04	BPD-0047	DD-472	BF5A1DD47	ED-0047	UC-5247	5GA-D47	
C60	.02	600	V15937-1	BPD-023	DD-223	BC8D23J	ED-02	GEM-4023	6TM-S2	
C61	.0047	600	210V014M05	BPD-0047	DD-472	CU84D47	GP-4700	GEM-6247	6TM-D47	
C62	.1	400	210V01JA04	P468N-J	DF-104	CU84J1		GEM-401	4TM-P1	
C63	.033	600	210V063A32	BPD-03	DF-303	CU86S33		GEM-6133	6TM-S33	
C64	4700		215V01JA54	BPD-0047	DD-472	BF5A1DD47	ED-0047	UC-5247	5GA-D47	
C65	.01	600	210V010M03	BPD-01	DD-103	BC8S1J	GP-10000	ACE61	6SE-S1	
C66	.01	600	210V010M03	BPD-01	DD-103	BC8S1J	GP-10000	ACE61	6SE-S1	
C67	.1	400	210V01JA04	P468M-1	DF-104	CU84J1		GEM-401	4TM-P1	
C68	.47	400	210V034M04	1484-00047		5R5T47	CY15C471K		MS-347	
C69	.1	600	210V13M02	1484-001	DD-102	1R5D1	CY15C102K	MCB255	MS-31	
C70	100		215V010A01							N330
C71	18-180		217V50M01							
C72	.01	600	210V010M03	BPD-01	DD-103	BC8S1J	GP-10000	ACE61	6SE-S1	
C73	.1	400	210V01JA04	P468N-1	DF-104	CU84J1		GEM-401	4TM-P1	
C74	.22	400	210V02JA24	P468N-22		CU84P22		GEM-4022	4TM-P22	
C75	.047	600	210V014M73	BPD-05	DF-503	BC86471		ACE647	6SE-547	
C76	100	50-100		BVD-50-100	DD60-101	BVD50T1			50GA-T1	Note 1
C77	.15	400	210V123M01	P468K-15		CU84P15		GEM-4015	4TM-P15	

CAPACITORS (cont)

ITEM No	RATING: CAP.	VOLT	Westinghouse PART No.	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C78	15	400	215V151A81	BPD-00068	DD-681	BF5A1DT68	ED-680	GEM-4015	4TM-P15	
C79	680		215V151A81	BPD-00068	DD-681	BF5A1DT68	ED-680	UC-5368	5GA-T68	
C80	680		215V151A81	BPD-00068	DD-681	BF5A1DT68	ED-680	UC-5368	5GA-T68	
C81	680		215V151A81	BPD-00068	DD-681	BF5A1DT68	ED-680	UC-5368	5GA-T68	
C82	680		215V151A81	BPD-00068	DD-681				5GA-T68	
C83	1000	1500		BVD-15-1000	DD30-103	BVH3D1	BD15-1000	DC30S15	30GA-D1	

Note 1: Some versions may use a 1600MMF ② 4KV (part #215V300M37) or a 5600MMF ② 5KV (part #215V300M39) in this application.

CONTROLS

ITEM No	RATING: RESISTANCE	WATTS	Westinghouse PART No	REPLACEMENT DATA: CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	1	270V005M02		A47-500K-S		U48	Volume
B	Shaft				FS-3		Not Req.	
C	Switch				SW2-12		U2-28	
R2A	15K	1	270V003M05	B-30	A47-15K-S	B11-U8	U28	Picture
B	Shaft			Not Req.	FS-3	#8K 1	Not Req.	
R3A	250K	1	270V01M03					Vert. Linearity
B	2Meg							Vert. Hold
C	100K		270V01M03					Brightness
R4A	500Ω	3						Quieting
B	5Meg							Height
C	50K							Horiz. Hold

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No	RATING: OHMS	WATT	Westinghouse PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R5	22K		250Y222A23	BTS-22K	
R6	6.8Ω 5%				
R7	18K			BTS-18K	
R8	680Ω			BTS-680	
R9	47K		250V234A73	BTS-47K	
R10	4700Ω			BTS-4700	
R11	4700Ω			BTS-4700	Note 1
R12	33K			BTS-33K	
R13	100K		250Y210A04	BTS-100K	
R14	8200Ω			BTS-8200	
R15	15K		250V215A53		
R16	18Meg 5%		250V218A58		
R17	100K		250V210A04	BTS-100K	
R18	39000Ω		259V003M02		
R19	39000Ω		256V003M02		
R20	4700Ω		250V234A73	BTS-4700	
R21	47Ω		250V234A70	BTS-47	
R22	82000Ω		V9937-21	BTS-8200	
R23	3900Ω		250V002A23		
R24	470Ω		250V234A71	BTS-470	
R25	47Ω		250V234A70	BTS-47	
R26	470Ω		250V234A71	BTS-470	
R27	150Ω		250V234A50	BTS-150	
R28	43000Ω	5%	250V214A32		
R29	47K		250V234A73	BTS-47K	
R30	470K		250V234A74	BTS-470K	
R31	1Meg		250V210A05	BTS-1Meg	
R32	120Ω		250Y221A21	BTS-120	
R33	3700Ω		250Y222A72	BTS-3700	
R34	3700Ω		250Y222A72	BTS-3700	
R35	6800Ω		250Y228A63	BTS-6800	
R36	8200Ω		V9937-21	BTS-8200	
R37	23K		250Y222A23	BTS-23K	
R38	3700Ω		250Y222A72	BTS-3700	
R39	10K		250Y210A03	BTS-10K	
R40	5600Ω		250Y225A62	BTS-5600	
R41	100K		250Y210A04	BTS-100K	
R42	100Ω		250Y221A01	BTS-100	
R43	33000Ω		250Y233A03	BTS-33000	
R44	1Meg		250Y210A05	BTS-1Meg	
R45	2200Ω		250Y222A22	BTS-2200	
R46	4700Ω		250Y234A71	BTS-470	

ITEM No	RATING: OHMS	WATT	Westinghouse PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R47	1681K		250V231A84	BTS-180K	
R48	12K		250V221A23	BTS-12K	
R49	1200Ω	1	250V232A21	BTA-1200	
R50	560Ω		250V225A61	BTS-560	
R51	390Ω	2	250V432A91	BTB-390	
R52	82Ω		250V232A30	BTS-82	
R53	1Meg		250V231A05	BTS-1Meg	
R54	470K		250V234A74	BTS-470K	
R55	27K		250V222A73	BTS-27K	
R56	56K		250V235A53	BTS-56K	
R57	22K		250V222A23	BTS-22K	Note 3
R58	39K		250V223A20	BTS-34K	Note 3
R59	6800Ω	3	250V228A30	BTS-6800	
R60	82K		250V238A23	BTS-83K	
R61	3300Ω 5%		250V232A23	BTS-3300 5%	
R62	27K		250V234A73	BTS-27K	
R63	150Ω		250V231A51	BTS-150	
R64	1Meg		250V231A05	BTS-1MEg	
R65	68K		250V226A83	BTS-68K	
R66	4.7Meg		250V235A74	BTS-4.7Meg	
R67	100Ω		250V231A01	BTS-100	
R68	560Ω		250V231A61		
R69	680Ω		250V233A61		
R70	470K		250V224A74		
R71	47K		250V224A73		
R72	56K	1	250V235A63	BTA-56K	
R73	1000Ω		250V231A03	BTS-1000	Note 4
R74	330K		250V232A34		
R75	330K	1	250V232A34	BTA-330K	
R76	330K		250V232A34	BTS-330K	
R77	150Ω		250V231A51	BTS-150	
R78	470K		250V224A74	BTS-470K	
R79	1000Ω	1	250V231A03	BTA-1000	Note 5
R80	12K		250V221A23	BTS-12K	
R81	2300Ω		250V232A23	BTS-2300	
R82	2.2Ω 5%		251V002A39	BW1-2.2 5%	Note 6
R83	100K	1	V9937-18	BTA-100K	
R84	180Ω	4	251V020M05		
R85	4.7Ω	5	251V004M05		
R86	1Ω	10	251V01M04		
R87	330K		250V233A34	BTS-330K	

Note 1: Some versions may use 3700Ω 1 W in this application.
Note 2: Some versions may use 12K in this application.
Note 3: Some versions may use 47K in this application.
Note 4: Some versions may use 1200Ω in this application.
Note 5: Some versions may use 2700Ω in this application.
Note 6: Some versions may use 3.3Ω in this application. (part #251V003A39)
Note 7: Some versions may use 370 15W in this application. (part #251V01M03)

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	Westinghouse PART No.	Halldorson PART No.	Merit RCA PART No.	TYPE No	Ram PART No.	Stancor PART No.	Thordarson PART No.	Tried PART No.
T1	Horiz. Output Trans.	402V004M02 / 402V004M03						ELY-054 / ELY-054	
T2	Vert. Output Trans.	430V003M02 ② / 430V033M01 ①	21900 ③	A-2322 ③ / A-2322 ①				A-108X ③ / A-108X ①	
T3A B	Yoke(90°Horiz(10MH) Vert(58MS)	490V005M01 ① / 489V003M64 ② / 768V014M01 ①	DF501.8 ③	MDF-92 ③	2352L ③	T90P19/43 ③	DY-16A ③	T-16 ③	T-41 & YC1 & C11 ③

① Alternate part number.
② Use 8 to 1 turns ratio.
③ Connect vertical output tube screen to B+.
④ Yoke rear cover and centering device.
⑤ Yoke clamp.
⑥ Requires new rear cover, centering device and yoke clamping device.
⑦ To mount same as original, connect yoke terminal #1 to horiz. output trans. terminal #4; yoke terminal #3 to horiz. output trans. terminal #3; yoke terminals #2 and #7 to resistor R8L. To mount with leads out bottom, connect yoke terminal #3 to trans. terminal #3; yoke terminals #2 and #7 to resistor R8L. To mount with leads out bottom, connect yoke terminal #3 to horiz. output trans. #4; yoke terminal #1 to horiz. output trans. terminal #3; yoke terminals #2 and #7 to resistor R8L.
⑧ Use original horiz. yoke clamping network, if necessary.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Tried Replacement Connections
						6	
5							5
4						4	
T		T					
3		3				3	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	SEC.	Westinghouse PART No.	REPLACEMENT DATA: Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Tried PART No.	NOTES
T4	2400Ω	3-4Ω	420V013M01	21U01 ①	A-3038 ①	A-3335 ①	24S68 ①	S-12X ①	① Use original channel mtg. frame & terminal board.

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: Westinghouse PART No.	QUAM PART No.	NOTES
SP1	4"	PM	3-4Ω	870V015M01	4A07	

COILS (RF-IF)

ITEM No.	USE	Westinghouse PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	1st Video IF	235V003M01				Includes 4L 23MC trap, 2.2 and 68MMF caps.
L2	2nd Video IF	236V004M01				
L3	47.25MC Trap	230V009M01				
L4	3rd Video IF	235V004M01				
L5	Series Peaking Coil	V15896-1		TV-1S1	6112	100 Microhenries
L6	Shunt Peaking Coil	V15896-8		TV-1S0	6132	350 Microhenries
L7	4.5MC Trap	V15795-1				
L8	Series Peaking Coil	V15796-3		1S-3135	6155	140 Microhenries
L9	Shunt Peaking Coil	V15796-8		TV-1S0	6133	350 Microhenries
L10	Series Peaking Coil	V15796-1		TV-1S1	6112	100 Microhenries
L11	Sound IF	V15795-2				
L12	Quadrature Coil	230V013M02				
L13	RF Choke	230V019M10	15-1096		4634	14 Microhenries
L14	RF Choke	230V019M10	15-1096		4634	14 Microhenries

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.: PRI.	SEC.	Westinghouse PART No.	REPLACEMENT DATA: MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No	Ram PART No.	Thordarson PART No.	Tried PART No.	NOTES
L16			230V005A01								

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	D C RESISTANCE	INDUCTANCE (D. CURRENT 100% %)	REPLACEMENT DATA: Westinghouse PART No	Halldorson PART No	Merit PART No	Stancor PART No	Thordarson PART No	Tried PART No
L16	.240A	19Ω	.43HY	430V023M01					C-34X

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Westinghouse PART No.	REPLACEMENT DATA
K1	Ant. Isolation	330MMF, 220K	219V004M02	Note 1
K2	Ant. Isolation	330MMF, 220K	219V004M02	Note 1
K3	Vertical Intergrator	22K, 2500V, 2200Ω, 2000MMF, 5000MMF, 5000MMF	V15866-1	Aerovox PA-501 Centralab PC-104 Sprague 103C12
K4	APC	82MMF, 82MMF, 390MMF, 680MMF, 4.7K, 12K, 1Meg, 220K, 680K	219V003M01	

Note 1: Used in chassis V2370. Chassis V2360 uses a 220K resistor (part #250V222A24) and a 470MMF capacitor (Part #213V01A47) in this application.

RECTIFIERS

ITEM No.	RATING: CURRENT (Measured)	Westinghouse PART No	FEDERAL PART No	GENERAL ELECTRIC PART No	INTERNATIONAL PART No	MALLORY PART No	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.
M1	.500A	285V005M01 ① ②	1032A ②	1N1007 ③	MR350 ③	6S350 ③	6QA3 ①2	250A ②

① Alternate part #285V005M02.
② Selenium type.
③ Germanium type.

PARTS LIST AND DESCRIPTIONS (Continued)

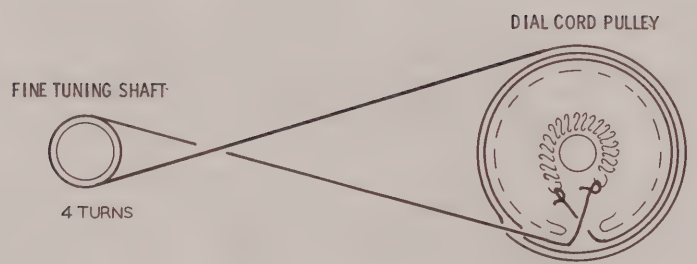
CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA		NOTES
		Westinghouse PART No.	SYLVANIA PART No.	
M2	*K6	V10916-3	1N60	Video Detector (Pigtail)

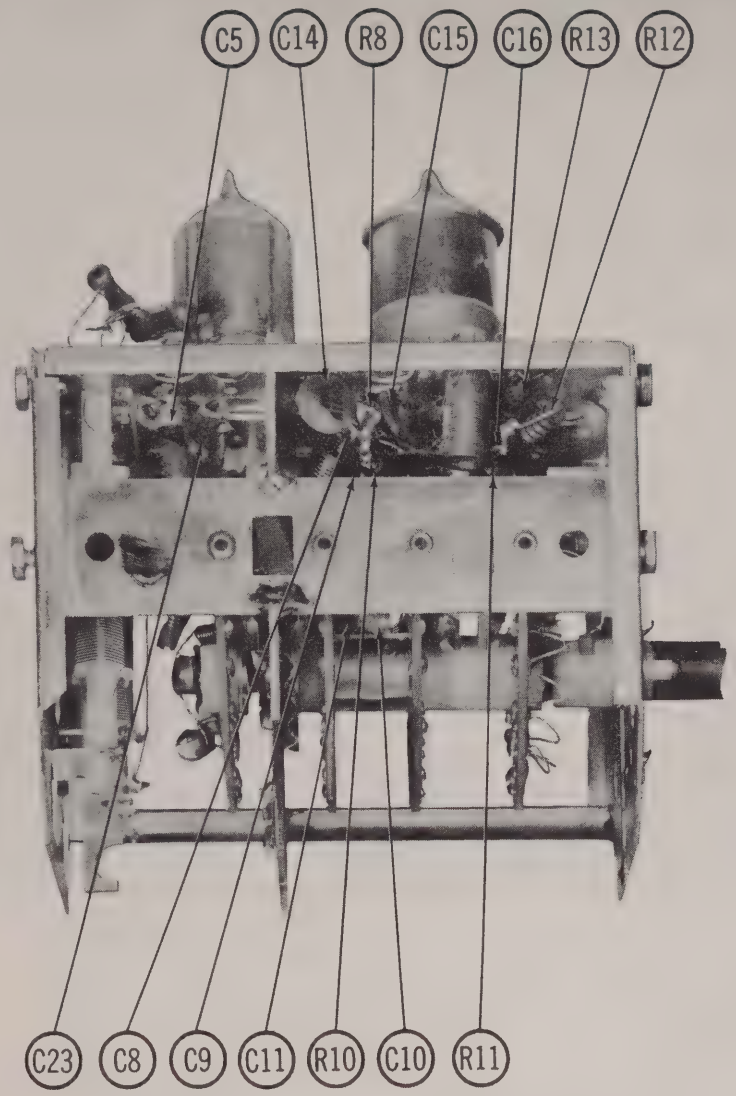
* A CK706A or 1N64 may be used in this application.

MISCELLANEOUS

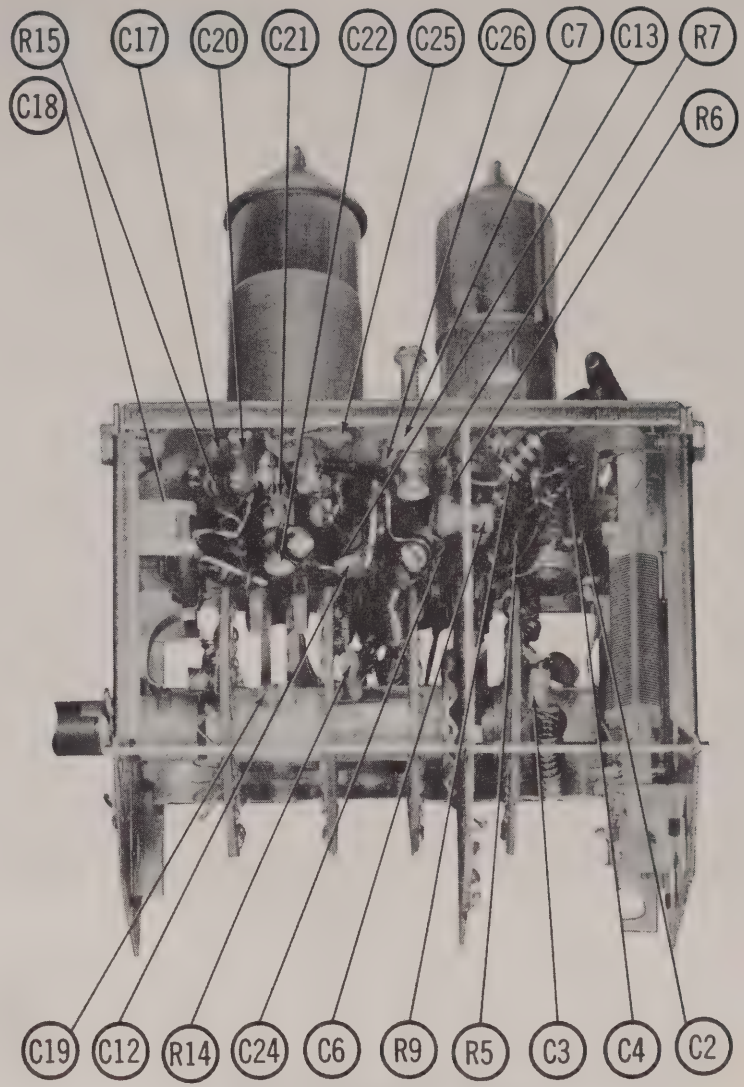
ITEM No.	PART NAME	Westinghouse PART No.	NOTES
M3	Tuner	470V013M01	VHF, Used in Chassis V-2370-42.
	Tuner	470V016M01	VHF, Used in Chassis V-2370-24.
	Tuner	470V013M02	VHF, Used in Chassis V-2380-201.
	Tuner	472V013M01	UHF, Used in Chassis V-2380-201.
M4	Crystal Det, Assy.	235V005M01	4th Video IF, Includes Caps, Series Peaking Coil and M2.
M5	Centering Device	781V081M01	Includes Yoke Cover.
M6	Ion Trap	757V501A04	Used Only With 17BUP4 Picture Tube.
	Yoke Clamp	768V014M01	
	Printed Board	350V023M01	
	Handle	558V048M01	
	Mask	613V002M02	
	Dial	550V029M01	UHF, Models H17TU175, 176, 177.
	Knob	550V032M05	VHF Channel Selector, Models H17T175, 176, 177.
	Knob	550V032M06	VHF Channel Selector, Models H17TU175, 176, 177.
	Knob	550V031M01	VHF Fine Tuning, Models H17T175, 176, 177.
	Knob	550V031M02	VHF Fine Tuning, UHF Tuning, Models H17TU175, 176, 177.
	Cabinet	510V010M02	Models H17T175, H17TU175.
	Cabinet	510V010M03	Models H17T176, H17TU176.
	Cabinet	510V010M04	Models H17T177, H17TU177.



UHF DRIVE CORD STRINGING

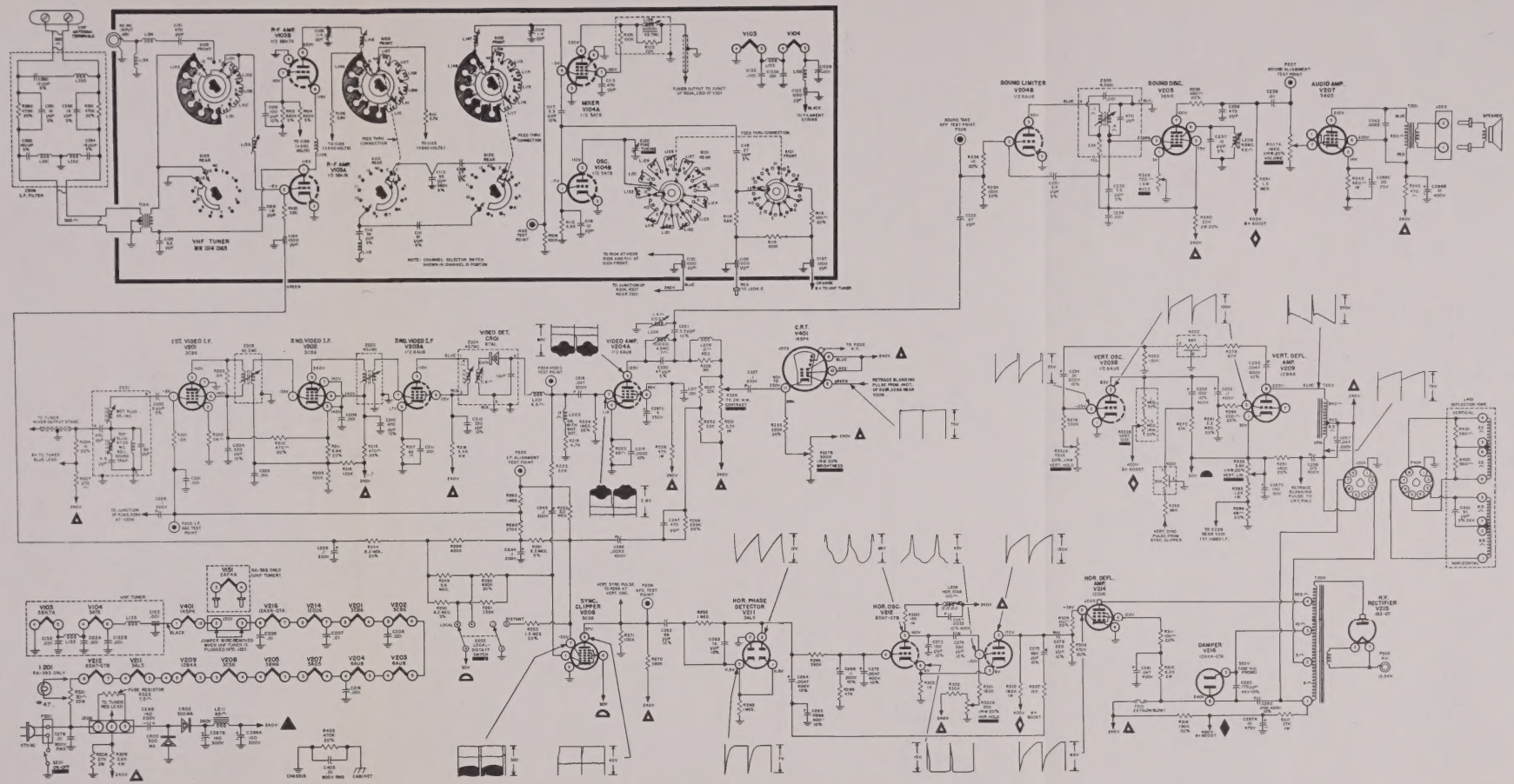


RF TUNER-LEFT SIDE



RF TUNER-RIGHT SIDE

DUMONT CHASSIS
RA-392, RA-393



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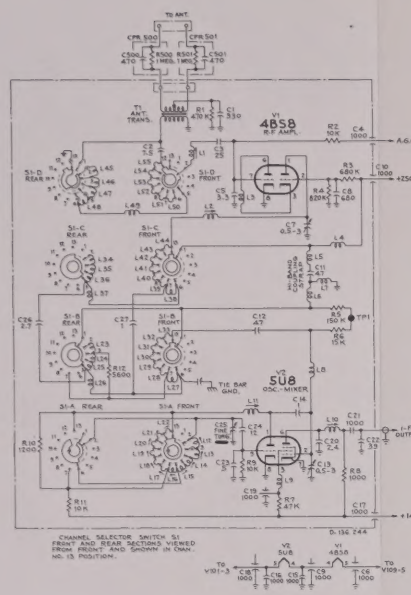
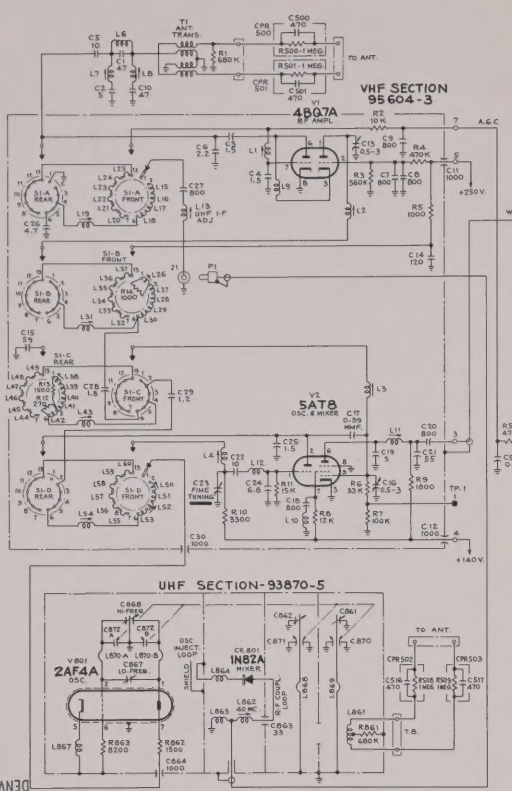
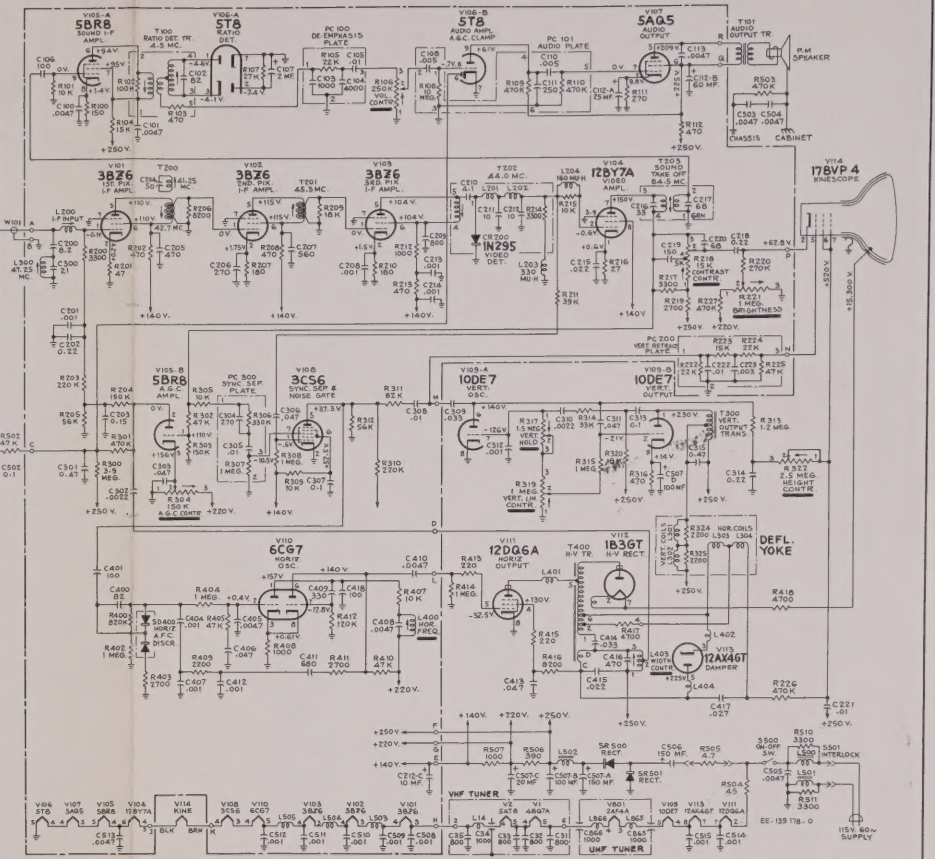
RCA MODELS	CHASSIS
17S7090	5377
17S7090U	5378
17S7092	5377
17S7092U	5378
17S7093	5377
17S7093U	5378
17S7099	5377
17S7099U	5378


4BS8
RF AMP.
5U8
OSC.-MIXER
CHANNEL SELECTOR SWITCH S1 FRONT AND REAR SECTIONS VIEWED FROM FRONT AND SHOWN IN CHAN. NO. 13 POSITION.





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